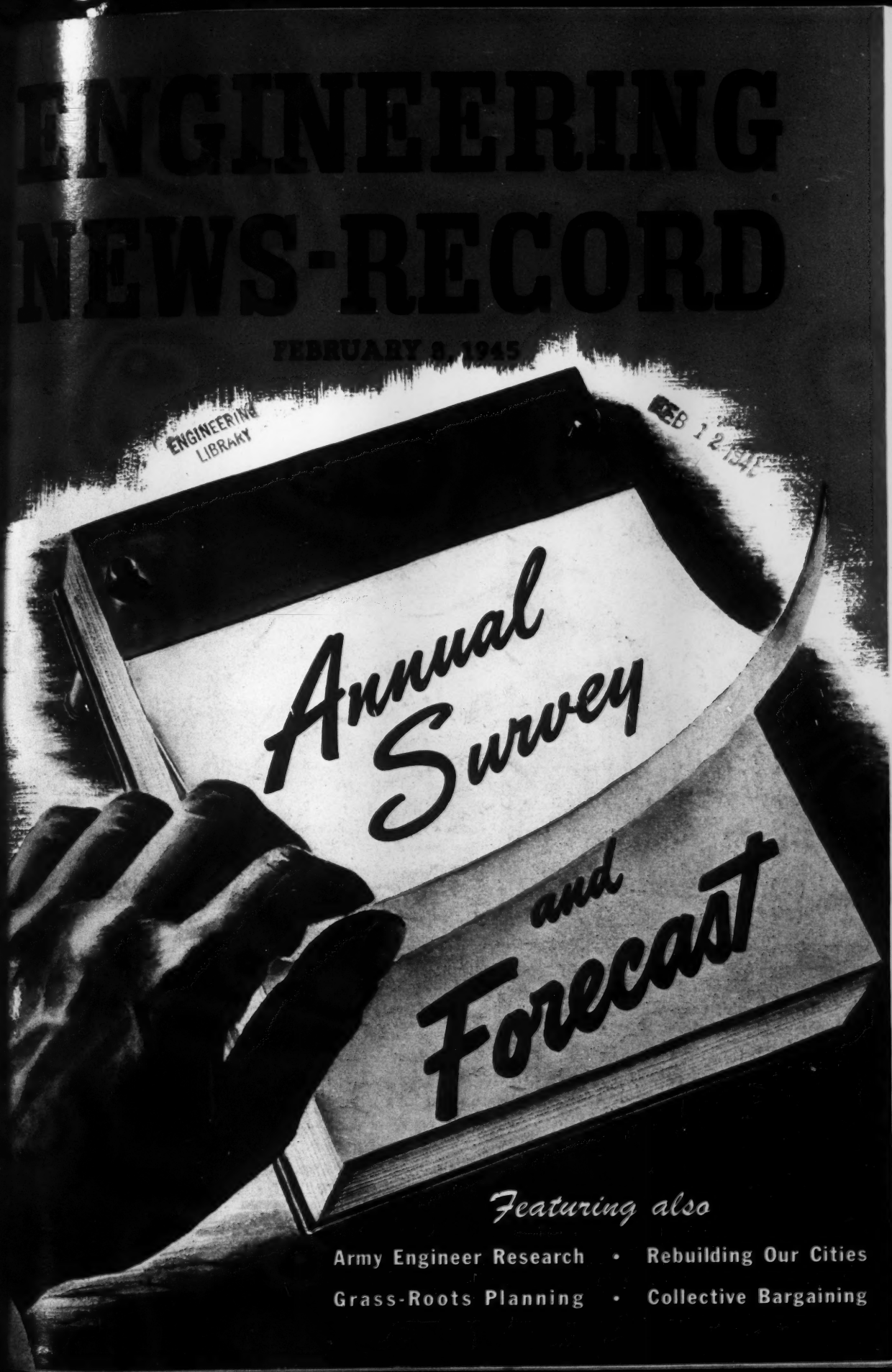
ENGINEERING NEWS-RECORD

FEBRUARY 8, 1945



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Vol. 134 FEBRUARY 8, 1945 No. 6

COMING NEXT

• Relining a big tunnel on a main line of the B & O Railroad without interfering with heavy wartime traffic was a problem of first magnitude. Through the crown drift driven on top of the old lining from a shaft sunk from the surface, the contractor first cleared out a zone of broken and faulted rock, tore out the old arch lining and then successfully built a new concrete arch lining while traffic proceeded undisturbed through the tunnel below. See *ENR* Feb. 22 for details.

• The resourcefulness shown by our engineer designers in adopting timber as a substitute for critical steel has been one of the highlights in wartime industrial plant construction. A recent example that merits attention will be described in the Feb. 22 issue. Three-hinged arches of 120-ft. clear span and rise of 72 ft. were made of glued laminated timber built up into an I-beam or double channel section. Factors controlling the design and method of erection will be discussed.

• Recent developments in the field of soil mechanics have shown that many former concepts relative to the action of soils require change or drastic revision to make them compatible with the facts. A simplified method, which is an adaption of the Rankine formulas, for computing earth pressures on retaining walls will be published in the Feb. 22 issue. A diagram illustrating the application of this procedure will be included.

LOOKING AHEAD

• Wartime shortages of manpower and critical materials in the waterworks field have necessitated many salvage and reconditioning processes. Every plant engineer has experienced the difficulties involved with obtaining priorities, wading through red tape and uncertain deliveries. Consequently, the short-cuts and improved methods for water meter repair employed by Chicago engineers, which has practically eliminated present day headaches, should be of special interest to other waterworks engineers throughout the country. A review of Chicago shop practice is scheduled for an early issue.

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The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • FEBRUARY 8, 1945 • VOLUME 134 • NUMBER 6

No big cut in construction seen necessary by WPB

Annual total estimated at 3¼ billion dollars despite possible further manpower controls. More facilities needed for production of several types of war goods

Although some groups in Washington have interpreted War Mobilization Director James F. Byrnes' recent demands for tighter production controls to conserve manpower as an indication of severe curtailment of construction, WPB officials do not regard this activity as meaning that the estimated 1945 domestic construction volume of 3¼ billion dollars predicted earlier in the year need be revised downward. This view is based upon two important factors.

Construction now limited

First of all, for many months the only construction permitted was that approved by the Area Production Urgency Committee, which is made up of representatives of the Army, Navy, War Production Board, War Manpower Commission, and other war agencies, and deliveries of all critical materials have been carefully controlled for a long period. As a result only construction essential to the war effort has been approved. The second major reason why no drastic cut is expected, and a very important one, is that the greater portion of work expected to be done in 1945 is directly connected to maintaining war production or increasing the output of some types of war supplies, the WPB states.

WPB opinion

In enlarging on the latter viewpoint, WPB officials point out that additional facilities are needed for greater production of several types of war supplies. For example, a program to produce 6,000,000 more truck tires and 1,200,000 large-size tubes annually has just been started, production of some types of airplanes is being tripled, ammunition, bomb and shell production is being stepped up greatly, a large chemical plant expansion program is planned, extensive highway construction and maintenance will need to be done, and considerable housing remains to be built, including much special housing for the Army and Navy. In addition, much work to provide community facilities in a number of war production centers may be done, as such construction is expected to pay big dividends in getting the maximum amount of work from the available manpower by cutting down absenteeism and by making the labor supply more stable.

More work if Germany falls

Final conclusion by the WPB is that although no one phase of the expected construction is large in itself, and despite the severe manpower problem now existing, the total construction volume at home is placed at 3¼ billion dollars if the European and Pacific wars both continue throughout the year, while the total is placed at nearly

(*Continued on page* 90)

Second tube of New York vehicle tunnel opened

The north tube of the Lincoln Tunnel under the Hudson River at New York was opened to traffic on Feb. 1 (ENR Feb. 1, vol. p. 154). Hereafter, the south tube, which was opened in December, 1937, for two-way traffic, will be used for eastbound travel and the new tube will carry westbound traffic.

Each tube is 31 ft. in external diameter and carries a two-lane, 21 ft. 6 in. roadway The north tube is 7,482 ft. long and the south tube, 8,217 ft. Each has an under-river section 4,600 ft. long.

Here shown, at the right, is the entrance plaza of the north tube, which lies between 10th and 11th Ave. and 39th and 40th St. The south tube continues under 39th St. to a point east of 10th Ave. Its plaza is in the walled cut at the lower left corner.

Tolls are collected at the New Jersey end where the two tubes have a common plaza.

The plaza of the new tube comes to street grade on a deck built over the depressed right-of-way for the New York Central West Side freight line. Ultimately, it is proposed to deck over this right-of-way cut as far north as 42nd St. and south to 34th St., thus forming a new access street between the two main crosstown streets.

Large New York public works program proposed by Governor Dewey

Over $200,000,000 from surplus available for construction in 1945-46. Express highway tolls suggested

In his budget message to the New York State legislature on Jan. 31, Governor Thomas E. Dewey proposed an expenditure for 1945-46 of $207,500,000 for public works out of accumulated surplus, provided that war conditions permit. The appropriation that he recommended is divided into these major categories:

Highway construction and reconstruction	$37,000,000
To replace authorized bonds for	
Highways	29,700,000
Parkways	29,600,000
Grade crossing elimination	48,800,000
Other departmental construction	56,100,000
Reconstruction and repair of present improvements	2,900,000
Equipment	3,300,000

The Department of Public Works has prepared a long-range program aggregating upwards of $800,000,000, but that would be for a period of five years or more to restore the state's facilities to a condition to meet postwar demands.

Much highway work needed

In speaking of the highway work the Governor said:

"The urgent highway program that confronts us aggregates some $620 million, exclusive of the proposed 'thruway' system (*ENR* Jan. 27, 1944, vol. p. 128). Within this total is more than $46 million for acquisition of rights-of-way that would have been borne locally if the state had not assumed this full cost by legislation enacted in 1944. I contemplate that legislation will be enacted this year to provide for the construction of the arterial highway system through cities. The cost for city arteries and village connections represents $119 million out of the $620 million.

"This makes a total of $165 million for rights-of-way and highway construction to be paid for by the state, which would otherwise have had to be paid for by the localities if this urgent work was to be done.

"I recommend whole-heartedly the development of the 'thruway', or express motorway, to bind together this state from New York City to Buffalo and on to the Pennsylvania border on Lake Erie west of Ripley. Frankly, I am not yet prepared to say that this special facility should be built at general state expense. The division of the budget has made a preliminary but intensive investigation of the feasibility of making this project wholly or largely self-supporting by tolls.

"The findings to date lead me to recommend that we explore more fully the possibilities of this course of financing. I would like to make my final recommendation on this matter in the future. In the meantime, I believe that preparations for the construction of the 'thruway' should move ahead with original costs to be reimbursed to the state if the project is made self-liquidating.

"If the 'thruway' could be self-financed the remainder of the program of the Department of Public Works would require some $640 million."

Federal assistance for the highway program, as presently constituted, will aggregate some $110 million for three years, including balances on hand. Should this public works program extend over six years and federal assistance continue at the same rate, the state would be required to finance some $430 million of the program.

Institutional improvements

In regard to departments other than public works Governor Dewey said:

"We will need to construct or reconstruct state improvements in an amount ranging from $100 million to $150 million. This is urgently required to eliminate present institutional overcrowding, to arrest the ravages of depreciation in present buildings and facilities, to make up for grave deficiencies in equipment, and to provide our administrators with tools more adequate for their important tasks."

• • •

Milwaukee contractors start safety contest

The first of a series of monthly safety meetings for the education of foremen and supervisors was held Jan. 29, by the Milwaukee chapter, Associated General Contractors of America. Floyd Frazier, staff engineer for the construction section, National Safety Council, and Geo. S. Cairns, safety engineer for the Milwaukee District, U. S. Engineers, announced plans for a safety contest among chapter members. The program of scheduled meetings and the contest will follow closely similar plans conducted by the Constructors Association of Western Pennsylvania, Pittsburgh, for the past several years. Although the membership of the Milwaukee chapter totals only 25 firms, there were 125 contractors and their supervisory personnel present.

Mr. Frazier told the group that while superintendents and foremen were key men in any safety program, they alone could not solve the accident problem. He said a successful plan for construction safety involved: (1) Architects and engineers; (2) contracting agencies; (3) construction management; (4) job supervision; (5) job workers; and (6) equipment manufacturers. Safety, he claimed, has never received proper consideration at the various stages of planning a project.

Costs of accidents were stressed by both speakers. Mr. Frazier pointed out that costs run up to 12 percent of total contract prices, and Mr. Cairns said that actual costs are always four times the compensation and medical costs. He also declared accident prevention calls for careful job planning, adequate supervision, proper instruction to workmen and the right training of workmen for specific tasks.

The program has been worked out by Stanley H. Eigel, manager of the Milwaukee chapter, AGC, and Otto Holmskog of the Employers Mutual Liability Insurance Co. O. Lupinski, chairman of the chapter's accident prevention committee, presided at the first meeting.

• • •

Ready-mix concrete prices up in 9 states

Ready-mixed concrete manufacturers in Wisconsin, Illinois, Indiana, western Kentucky, North and South Dakota, Minnesota, Iowa and eastern Missouri may increase present ceiling prices by the actual additional cost resulting to them from the recent increase granted to manufacturers of cement in that area, the Office of Price Administration has announced.

The amendment, effective Feb. 3, will restore to producers of the ready-mixed products margins comparable to those realized before the increase in cement prices was granted on Jan. 8.

The adjustment in cement prices was not to exceed 20 cents a barrel. Since the actual increase will not be a uniform amount, ready-mixed concrete producers have been permitted to add to their present ceilings the actual amount of increases resulting to them, rounded off to the nearest five cents per cubic yard.

Many Ohio cities are now suffering an acute water supply shortage

Long continued drought and freezing weather reduce supplies to dangerous levels. Emergency measures taken.

A number of Ohio cities, especially Columbus, the capital, have been suffering from an acute water shortage. The difficulties arise from the accumulated effects of a long-continued drought, inadequate storage facilities and unusually cold weather. A general lowering of the underground water table in Ohio, which has been evidenced for a long time, is causing widespread concern.

Emergency remedial measures now being taken include: pumping water to reservoirs from new sources such as wells and abandoned quarries; removing ice, debris and silt from reservoirs; curtailment of industrial plant supplies; and restrictions on water use by consumers.

At Columbus the troubles resulted from draw-down of the water behind O'Shaughnessy Dan on the Scioto River, where normally 4,400,000,000 gal. is stored. Using almost 40,000,000 gpd., the city has drained this reservoir almost dry, as shown by the accompanying photograph. The auxiliary Griggs Dam has also been lowered to a dangerous degree. The biggest industry in the city, the Curtiss-Wright plant, was closed temporarily on Jan. 24 on account of the water shortage.

Water division pumping crews, tapping all quickly available supplies, were able to raise the production of water to 36,000,000 gpd., but officials said that supply conditions would continue critical until a good thaw or heavy rainfall occurs. Clarence B. Hoover, superintendent of the water division, said, "There is enough water in the Scioto River watershed but it's all frozen and unless we get a thaw before our emergency supply runs out we may have another shortage."

Columbus City Council has been urged by Service Director Elmer Keller, to install permanent piping to utilize back water of the Olentangy River as a water supply. A 1,500-foot pipe line has been laid to the Scioto River near the city filtration plant. Although the line runs to the Scioto River, the water pumped is from the Olentangy River, which has been backed up to a dam opposite the filtration plant. The Scioto river itself is virtually dry.

David A. Harker, chief of staff of the Ohio Water Supply Board, said that Griggs Dam, constructed in 1905, had filled at least one-third with silt, and that O'Shaughnessy Dam, built in 1925, was losing three-fourths of 1 percent of its capacity yearly for the same reason. He expressed the belief that dredging might provide sufficient storage capacity to meet emergencies.

An emergency pipeline

Columbus has begun laying an emergency ground surface pipeline to the Scioto River. The Ohio Fuel Gas Co. loaned the city some 1,500 ft. of pipe and the men to lay it. The new line is expected to supply 13,000,000 gpd. and reduce the shortage to only 13 percent under normal supply, said Mr. Hoover.

The City Council authorized Service Director Keller to arrange to obtain supplemental water supplies from an abandoned quarry near Belle Point, covering an area of 41.3 acres and containing about 500,000,000 gal. of water.

Army Engineers help Lima

Called to Lima, when two fires within a week recently had virtually depleted the city's water supply, Army ordnance department engineers exercised top priorities in an effort to prevent closure of vital war industries. With a citizens committee named by the mayor they launched a nation-wide telephone hunt for equipment necessary to tap a 30-day water supply in water-filled quarries northeast of the city, three miles from municipal storage reservoirs.

Prisoners of war are laying the pipe and installation of power lines to operate the pumps has started. Officials warned that the city faced a critical period unless snow thaws occurred, as less than a week's supply of water remained in the reservoirs and the pipe laying was expected to take from two weeks to a month.

Purifying equipment was set up at a private well operated by the Standard Oil Co. refinery in Lima to provide 1,500,000 gallons daily, or about one-fourth of the normal daily consumption, and other private wells were tapped to increase the supply further until the pipeline could be laid. Well water in the area, however, is heavily sulphurous and is used only in emergencies.

The Ohio Department of Health has approved five tentative sets of plans for expanding the water storage facilities of the Lima waterworks, and has urged the city to waste no time in putting one of the plans into effect. Council has yet to determine which of five proposed sites should be be selected for a reservoir.

Big filtration plant proposed

Representatives of industries in the Miami Valley at Cincinnati on Jan. 29 offered the suggestion that a large filtration plant using water both from underground sources and from the Ohio River could serve all the industries in Hamilton County and might aid the solution of the problem of diminishing groundwater in southern and south central Ohio. Wilber Scott, state geologist, foresees the scattering of industries if water continues to diminish.

(*Continued on page* 92)

Press Assn.

Empty reservoir is mute evidence of water shortage

Columbus is one of many Ohio communities now suffering from an acute scarcity of water. This view of the empty O'Shaughnessy Dam reservoir, normally the city's chief source of water supply, clearly indicates the seriousness of the situation.

No big construction cut

(*Continued from page 87*)

four billion dollars if Germany is defeated in the spring and the Japanese war continues throughout the year. Although $3¼ billion represents the lowest volume since 1935, this would be the lowest volume since 1935, the smaller amount would be 82 percent of the work done in 1944.

A breakdown of this volume shows that military construction within the United States is placed at $480,000,000 and government-financed plant construction at $470,000,000, while privately financed construction is placed at $250,000,000, a 7 percent increase over the 1944 level. The overall housing volume is estimated at $500,000,000. All other types of non-industrial construction—comprising highways, community facilities, farm and other non-residential work—are expected to total $1,550,000,000, a slight increase over the 1944 activity for this type of work, the WPB estimate indicates. (For a breakdown of these figures see *ENR*, Dec. 14, 1944 vol. p. 737.)

When queried as to the possible severe curtailment of the plant construction program because of the manpower problem and possible over-expansion in some war production facilities, WPB representatives said some controls would be strengthened, but foresaw no drastic curtailment for the reasons previously explained. Also, although admitting some war plants were perhaps built too large, the number of over-sized plants is considered so small as to be insignificant.

No early removal of restrictions

In regard to the possible 40 percent reduction of war production with the end of the European war and thus the release of large numbers of war workers and huge quantities of materials, which was the plan announced last fall when defeat of Germany within a few weeks appeared possible, the WPB is now taking an entirely different viewpoint. At present it believes that full production will be maintained to permit the maximum strength of the Allies against the Japs.

The fact that no drastic cut of construction is planned to ease the manpower problem does not mean, however, that the supply of building materials has improved greatly in recent months. Increased military demands have wiped out an expected surplus of most supplies of steel, copper and copper alloys. Sheet steel deliveries for practically all mills extend well into 1945, plate mills are booked through the first quarter of the year and the production of bar joists is not keeping up with demand, while cast iron pipe is still critical.

Chromium metal also is extremely critical, although until recently plentiful. The picture as to lumber has grown worse as production has dropped below earlier estimates and is more critical than ever before. Other materials extremely short are plywood, metal lath, metal windows, and small motors.

The generally available materials include: portland cement, concrete masonry productions, concrete pipe, gypsum board, brick, structural clay tile and asbestos-cement pipe, reinforcing bars and light-weight mesh. Although the available materials permit some types of construction to go ahead, the general outlook as to building supplies is not good and is not expected to improve in the next few months.

In contrast, the WPB considers the picture as to construction equipment much better. Although the military forces are in great need of more trucks, tractors, cranes, and other heavy construction equipment, the WPB believes the contractors of the country to have sufficient equipment on hand to carry out all the work expected to be available this year. In fact it is believed that they have on hand sufficient equipment to start a large construction program once the war restrictions are removed. However, plans as to how controls on construction will be eased when this becomes permissible are indefinite.

• • •

Hickey is new director of Washington highways

Clarence Hickey, for 40 years prominently associated with public works in the state of Washington, has been appointed director of the State Department of Highways, succeeding Burwell Bantz, director since July, 1941. Appointed by Washington's new governor, Mon C. Wallgren, Mr. Hickey has headed the Snohomish County road department for the last ten years.

Mr. Hickey's wide experience in engineering has included right-of-way and construction surveys and waterworks construction, as well as private engineering practice and road department activities. He worked on water systems in Everett, Wash., and western Oregon, and serving six months as assistant city engineer of Bremerton, Wash. Later he entered private practice in Everett and subesquently was made office engineer for the Snohomish County Road Department in 1925. An active member of the Washington State Association of County Engineers, Mr. Hickey has served as secretary, vice-president and president of the organization.

Public Health Service fights rats at Tacoma

Emergency measures to suppress an outbreak of bubonic plague among rats at the Port of Tacoma, Wash., were instituted by the U. S. Public Health Service in mid-January when not only the large industrial section adjacent to the waterfront, but areas near principal port facilities and the Todd Tacoma shipyards were found to be infested with diseased rodents.

Routine trapping of rats in Pacific Coast ports last October uncovered the recurrence of plague in Tacoma, which first broke out late in 1942. First areas found to be infested were near flour mills and a meat packing plant on the waterfront, and later plague was discovered throughout the industrial area and along the quays, which are one to several miles in length.

Immediate extinction measures were aimed against both sick and non-infected rodents, including trapping, use of poisonous baits, gassing of burrows with cyanide and fumigation of buildings with cyanide and methyl bromide.

When Tacoma's rat population continued to pose a serious threat early in January, Dr. N. E. Wayson, San Francisco, medical director of plague suppressive measures for the U. S. Public Health Service, ordered 20 government men to Tacoma to destroy rats near the waterfront, rail and truck transportation facilities. Meanwhile, the Port of Tacoma labored under restriction of a maritime quarantine on the harbor.

As the U. S. Public Health Service joined city and state sanitary engineers in executing immediate control measures, local officials concentrated on a long range program of removing rat-harborage and rat-proofing structures in the infested areas.

With virtually all of Tacoma's waterfront faced with rip-rap, interstices of which provide ideal housing for rats, temporary filling of the crevices with coarse gravel has been undertaken. Replacing rip-rap with a concrete bulkhead is considered as a postwar project.

Numerous property owners on the industrial waterfront were ordered to raise temporary buildings 18 inches off the ground; build concrete foundations for warehouses; rat proof storage bins; install sheet metal flashing between wood and steel junctions in buildings; store lumber, fruit and vegetables on racks above the ground; cover lower floor windows with wire cloth mesh and clean dock floors and freight car loading platforms. Garbage disposal methods, and efforts to remove the rodents' food supply and induce them to seek poison, are being enforced.

Engineers told active promotion needed to have adequate plans ready

Combined meeting of Engineering Societies hear that $15 billion planning program lags. Greater stimulation necessary.

A conference on postwar construction, as a panel of a meeting of the Engineering Societies' Committee on War Production and Future Planning last week in New York City, heard several speakers advocate active promotion of planning as a necessary step for engineers and architects if construction is to carry a greatly increased load of immediate employment after the war. This is especially true if the A.S.C.E. goal of $15 billion in plans is to be ready in the first postwar year.

C. Scott Fletcher, national executive director, Committee for Economic Development, pointed out that 2300 local units of the C.E.D. need the help of civil engineers to get both private and public plans prepared faster. Emphasizing that C.E.D. is composed of business men whose objective is to increase jobs, Fletcher stated that 45 percent more jobs must be provided than existed in 1940.

Private plans lagging

C.E.D. local committees have been asking employers how many employees they will release temporarily, and permanently, when the war emergency ends, then have tried to find out what jobs will locally be available to take care of workers released plus those available from the armed services. Current indications are that assistance of engineers, architects and other influential men is needed to get more of the plans ready for immediate use. Private plans are lagging seriously but, said Mr. Fletcher, an improved overall economic plan including clarification of future taxes, disposal of surpluses and the like will tempt private investment capital.

G. Donald Kennedy, chairman of the Committee on Postwar Construction of the A.S.C.E., said that the emphasis from now on should be on stimulating preparations for private construction, which is lagging critically. If the two-thirds of total construction that should involve private investment does not materialize after the war, public works cannot hope to make up any serious lag in the private field. Mr. Kennedy said he believed that the greatest obstacle to overcome is the lack of understanding on the part of many persons, in strategic public and private positions, and that it generally takes longer to prepare for construction than to carry out the program. The fact that difficulties may arise in the preconstruction stage, which will force drastic revision of an entire plan, delays in financing and land acquisition are things that apparently do not occur to many officials.

State and local work needed

Mr. Kennedy pointed out that the greatest increase in construction activity every achieved was 43 percent in 1936 over 1935, but if we are to start the postwar program from the $3.8 billion of 1944, it would require a 400 percent increase in one year to achieve the $15 billion goal.

The fact that a $300 billion federal debt is expected by war's end, in contrast to the local governmental debt total of $13 billion and the total state debt of less than $2 billion for the nation, indicates that a trend toward greater state and local assumption of public works' cost is very necessary.

Irving V. A. Huie, commissioner, Department of Public Works, New York City, and chairman of the program, told the group that New York City's postwar public works program totaled $1,190,000,000 in construction costs. On these projects, plans, specifications and contract documents are complete for 24.7 percent of the program or $294,000,000. Plans over 50 percent complete amount to $223,000,000 and plans started but less than half complete are for work valued at $386,000,000.

New York leads in planning

Commenting on the report concerning work for the City of New York, Mr. Kennedy said that New York City and New York State were far in the lead on actual planning and that, unfortunately, figures given by Mr. Huie could not be taken as an indication of what is going on throughout the country; in fact, Mr. Kennedy pointed out, according to the Business News Department service of *Engineering News-Record*, which is used by the A.S.C.E. Committee on Postwar Construction for planning statistics, only half a billion dollars total of postwar projects are ready for bids today with over $6 billion more which are in some stage of design.

Other panels of the combined Engineering Societies' meeting discussed postwar possibilities of newly developed materials.

Hearings continued on Mexican water treaty

Hearings on the proposed water treaty with Mexico that were begun on Jan. 27 before the Senate Foreign Relations Committee (*ENR* Jan. 25, vol. p. 100 and 123) are still in progress, with opponents of the treaty being heard as this issue goes to press.

During the first few days of the hearings, representatives of the International Boundary Commissions, including L. M. Lawson, commissioner, Frank B. Clayton, counsel for the United States Section, C. M. Ainsworth, consulting engineer to the commission, and Robert L. Lowry, engineer, described features of the treaty, the problems that the two governments are meeting in the river basins, and how those problems are to be solved by the construction and operations permitted by the treaty. These men also outlined the history of the negotiations with Mexico, the Colorado River Compact, and the Boulder Canyon Project Act, which form the basis of the proposed allocation of water to Mexico.

Mr. Lowry, in testifying on the controversial question of how much water would be available in the Colorado River, estimated that the total flow under virgin conditions at the international boundary below Yuma, Ariz., was 18,131,000 acre-ft. annually. This total would consist of a virgin flow (or reconstructed flow) at Lee Ferry of 16,271,000 acre-ft., an inflow between Lee Ferry and Boulder Dam of 1,060,000 acre-ft., an inflow from Boulder to Imperial Dam of 195,000 acre-ft., a virgin flow of the Gila River of 1,300,000 acre-ft., an estimated salvaged water below Boulder of 380,000 acre-ft.

Mr. Lowry also explained that the allocation of 1,500,000 acre-ft. of Colorado River water was to be made up as follows: return flow, 930,000 acre-ft.; desilting water, 100,000 acre-ft.; unused Gila River flow, 100,000 acre-ft.; and a residual of about 375,000 acre-ft. supplied from the main stream.

The estimates made by Mr. Lowry were substantiated in testimony by R. J. Tipton, consulting engineer, representing the Six States Committee, and by that of John R. Riter, hydraulic engineer, Bureau of Reclamation.

Representatives of a number of states have also been heard. Charles A. Carson, attorney for the Colorado River Commission of Arizona, and official representative for that state, went on record as strongly supporting the treaty. L. C. Bishop, representing Wyoming as state engineer, also supported the treaty. He stated:

(*Continued on page* 93)

Many Ohio cities have an acute water shortage

(*Continued from page* 89)

Springfield is also suffering from water shortage, and is preparing to sink a test well some 400 to 500 ft. into the bed of a long-buried glacial river channel in a search for increased water supplies Other cities which Mr. Harker said had been cautioned against inadequate water supplies were Canton, Warren, Alliance, Mansfield, Wilmington, Dayton, Norwalk, Hamilton, Middletown, Washington Court House, Coshocton, Crestline, Oak Hill, and Hillsboro.

Mr. Harker said Ohio's rainfall, averaging 37.93 inches annually, was adequate for general needs provided adequate supplies were stored in reservoirs to carry users over drought periods.

Control of Mahoning River

Control over manipulation of the Mahoning River's flow to insure that industries in the Youngstown area get maximum use out of every available gallon of water would be given to the Ohio Water Supply Board under a recommendation of that board.

"Industries of the Warren-Youngstown area long ago outgrew the groundwater supply", the report said. "For many years prior to 1916 they had depended upon the uncontrolled flow of the Mahoning River, but the rapid growth of industries following the first World War and the accumulated rainfall shortage since 1930 have made it increasingly difficult for industries to depend upon the flow of the stream, augmented only by Milton Reservoir.

"In 1916 Youngstown constructed Milton Reservoir, which gave scant assistance in providing water for the industrial area extending through two counties. The federal government constructed two additional reservoirs, Berlin and Mosquito, with the result that the low flow of the Mahoning River can be maintained at approximately 200 million gallons daily.

"This has naturally helped the war-important industries of the area, but their primary water requirements total 1,200 million gpd. which means that the entire controlled flow of the river must be used over and over. It is yet difficult during the summer months to keep the temperature of the Mahoning River below 100 degrees at Youngstown."

The Ohio Water Supply Board also asked that it be established as the stream gaging agency for the state, with the actual work to be done either by the board itself or by the U. S. Geological Survey, as the board may see fit from time to time.

Naval facilities bill passed by senate

Last week the Senate passed a bill (S. 208) providing $1.5 billion of naval shore facilities. The Senate-approved measure differs little from the corresponding bill (H.R. 626) passed by the House of Representatives Jan. 17.

Requiring only presidential approval to become law, the bill provides for a large amount of construction. Major items are as follows—:

Ship repair and laying-up facilities, $230,222,000; fleet training facilities, $12,000,000; aviation facilities, $74,500,000; storage facilities, $19,950,000; Marine Corps housing and training, $14,190,000; ordnance facilities, $65,500,000; personnel training and housing facilities, $40,022,000; hospital facilities; $28,519,000; miscellaneous structures and facilities, $41,265,000; and advance base construction, $986,000,000.

Pennsylvania will spend $4,000,000 this winter to keep its road system free of snow and ice, according to John U. Shroyer, sect. department of highways.

J. C. Baker made director of Arkansas highways

James C. Baker, assistant chief engineer of the Arkansas Highway Commission, has been appointed highway director by Gov. Ben. Laney. Mr. Baker started with the Arkansas Highway Department in 1922. He served as district engineer at Paragould for one year and was then transferred to the main office in Little Rock as state maintenance engineer. Later, he served a two-year term as highway director.

Mr. Baker succeeds W. W. Mitchell who has been with the department since 1923, having served as district engineer at Fort Smith, and also as assistant chief engineer in Pulaski County district 10. In 1928 he was made assistant chief state engineer, in charge of the western district of 33 counties. Going out in 1939 with a change of administration, he became chief engineer for the Public Works Administration for Arkansas. He was made state highway director in February, 1938. As yet he has not announced his plans for the future.

JOBS OF THE WEEK

IRRIGATION PROGRAM, Mexico.

National Irrigation Commission, Mexico City, will construct an irrigation program, at an estimated cost of $10,000,000 by its own forces.

DWELLINGS, Compton, Calif.

Willowbrook Development Co., Los Angeles, Calif., awarded a contract for constructing 563 one-story, frame stucco dwellings on Imperial Highway and Central Ave. to Paul W. Trousdale, Los Angeles. The estimated cost is $3,000,000. Seaboard Engineering Co., Beverly Hills, is the engineer.

ROADS and STREETS, Panama City, Panama.

Republic of Panama, Panama City, is constructing connecting roads and reconstructing city streets by day labor at $1,276,919.

CHEMICAL PUMP PLANT, Memphis, Tenn.

Buckeye Cotton Oil Co., Memphis, awarded a contract for the design and construction of a plant to produce chemical pulp from cotton linters, on a 4-acre site to H. K. Ferguson Co., Cleveland, Ohio. The estimated cost is $2,200,000. Defense Plant Corp. will finance.

ENLARGING RUBBER TIRE PLANT, Waco, Tex.

Brown & Root, Houston, Tex., have been awarded a contract for doubling the capacity of a tire plant, by General Tire & Rubber Co., Akron, Ohio. The estimated cost is $1,600,000. Denfense Plant Corp. will finance.

OUTSIDE SERVICES, White Oak, Md.

Harwood-Nebel Construction Co., Washington, D. C., has been awarded a contract to build outside services at Magnetic Laboratory Buildings by the Bureau of Yards & Docks, Navy Department, at $1,114,000.

TUNNEL and RIVER CHANNEL IMPROVEMENTS, Boulder City, Nev.

Bureau of Reclamation, Department of the Interior, Boulder City, received the lowest bid for tunnel and river channel improvements at Boulder Dam, Boulder Canyon Project from Guy F. Atkinson Co., Long Beach, Calif., at $2,586,450.

Note—Additional bidding and contract news on many projects large and small appear in the Construction News section beginning on page 265.

OBITUARY

William B. Gregory, 74, professor emeritus in experimental engineering and hydraulics at Tulane University, died in New Orleans, La., Jan. 29. An authority in hydraulic engineering since 1938, he had been associated with Tulane University for more than 40 years. A graduate of Cornell University, he served as a major in the first World War and was cited for his services in France. In 1928-29 he was consultant engineer to the U. S. Army Engineers in hydraulic tests for the Bonnet Carré spillway.

John Brandt, 102, for many years a general contractor at Duluth, Minn., died there recently. He had been retired since 1905.

Daniel Lafleche, well-known contractor of Ottawa, Ont., died in that city on Jan. 28.

A. Charles Irwin, 63, an authority on railway engineering construction, died Jan. 30 in Chicago. A civil engineering graduate of Ohio University in 1903 and of Cornell University in 1909, Mr. Irwin was associated with the Portland Cement Association, Chicago, as manager of its railway bureau from 1917 to 1938, when he resigned to become assistant subway engineer with the Department of Subways and Superhighways, Chicago, which position he held until his retirement last year.

Denis F. O'Brien, 80, inventor and manufacturer of waterworks equipment, died in East Orange, N. J., on Jan. 31. Mr. O'Brien was chairman of the A. P. Smith Manufacturing Co. Born in County Kerry, Ireland, and educated at Dublin University, he came to this country in 1882. He invented and held patents on a water hydrant that is widely used, and also many types of valves.

John Williams, 77, retired engineer and contractor, died at Brewster, N. Y., Feb. 2. In partnership with the late James J. Frawley, Mr. Williams did much heavy masonry work in New York City. Their firm, the Williams Engineering and Contracting Co., built several Manhattan piers, as well as the anchorages of the Manhattan and Queensboro bridges. As a member of an engineering board appointed by the late Gov. Alfred E. Smith, Mr. Williams assisted in the selection of the site for the Manhattan tower and anchorage of the George Washington Bridge.

Mexican water treaty

(*Continued from page* 91)

"Wyoming state officers have given this subject much study and serious consideration. I have been over the entire project on the ground, including the irrigated and irrigable lands in Mexico and the United States. I believe the allocation of 1,500,000 acre-ft. to Mexico to be fair and equitable and sincerely hope that the treaty with Mexico making this allocation meets with the approval of the Senate of the United States."

Senator Pat McCarran, official representative of Nevada, opposed the treaty on the basis that the allocation of the Colorado River water was unfair to this country and on the grounds that the proposed method of administration would give the boundary commission too much power.

Arguments against the treaty came also from the California representatives, including Governor Warren; M. J. Dowd, chief engineer of the Imperial Irrigation District; State Engineer Edward Hyatt; Frederick Fowler, San Francisco consultant; C. C. Elder, Los Angeles engineer; Phil D. Swing, attorney for the San Diego County Water Authority; and Arvin B. Shaw, Jr., attorney for the Palo Verde Irrigation District. Although all the California representatives found fault with the treaty in one way or another, the strongest attack was by Governor Warren.

Governor Warren took a similar view to that expressed by Senator McCarran. In addition, he held that a separate treaty should be made for each stream, an approach that spokesmen of the federal government asserted was not possible. He also urged that any treaty for distribution of Colorado River water be based on a sliding scale arrangement for determining Mexico's share. Other changes sought by Governor Warren were a ban on purchase of public or private property by the proposed water commission and a ban on Mexican participation in power revenues from the All-American Canal.

Proponents of the treaty have not had an opportunity to complete their testimony on Governor Warren's suggestions, but they take the view that no treaty incorporating these changes could be negotiated.

Although no official representative from Utah has been heard, three men from that state testified against the treaty. These men included Fisher Harris, who represented the Metropolitan Water District of Salt Lake. He claimed that Mexico would fail to ratify the treaty if that country were informed of the quality of the water that country would get.

MEETINGS

Regional and Local

ILLINOIS HIGHWAY ENGINEERS AND COUNTY HIGHWAY SUPERINTENDENTS, annual conference, at University of Illinois, Urbana, Feb. 14-16.

ONTARIO GOOD ROADS ASSOCIATION, annual convention, Royal York Hotel, Toronto, Canada, Feb. 28-March 1.

MISSOURI VALLEY CONFERENCE OF STATE HIGHWAY DEPARTMENTS, Palmer House, Chicago, March 1-3.

MINNESOTA SECTION, AMERICAN WATER WORKS ASSOCIATION, Minneapolis, Minn., March 9-10 (tentative).

ILLINOIS SECTION, AMERICAN WATER WORKS ASSOCIATION, Chicago, Ill., March 12-13 (tentative).

INDIANA SECTION, AMERICAN WATER WORKS ASSOCIATION, Lafayette, Ind., March 15-16 (tentative).

NORTH WEST GOOD ROADS ASSOCIATION OF MINNESOTA, annual meeting, Nicollet Hotel, Minneapolis, Minn., March 16.

SOUTHEASTERN SECTION, AMERICAN WATER WORKS ASSOCIATION, Jefferson Davis Hotel, Montgomery, Ala., March 19-21 (tentative).

CANADIAN SECTION, AMERICAN WATER WORKS ASSOCIATION, Royal York Hotel, Toronto, Canada, March 21-23 (tentative).

Cancellations

THE AMERICAN CONCRETE INSTITUTE, annual convention, New York City in February.

OHIO SOCIETY OF PROFESSIONAL ENGINEERS, Columbus, Ohio, Feb. 15-16.

ARKANSAS ENGINEERS CLUB, Feb. 23-24.

AMERICAN SOCIETY FOR TESTING MATERIALS, committee week, Pittsburgh, Pa., week of Feb. 26, and Spring meeting Feb. 28.

AMERICAN RAILWAY ENGINEERING ASSN., Chicago, March 13-15.

FLORIDA ENGINEERING SOCIETY, Jacksonville, Fla., March 15-16.

Huntsville, Ala., proposes to erect a new water purification plant and reservoir to cost about $350,000. It will have a capacity of 5,000,000 gpd. The new steel reservoir will hold 2,000,000 gals. Plans were drawn by Polglaze and Basenberg, Birmingham engineers.

This Week *in Engineering and Construction*

(*Continued on page* 156)

Engineering News Events of 1944

PAGE NUMBERS JANUARY TO JUNE REFER TO VOL. 132; THOSE IN JULY TO DECEMBER REFER TO VOL. 133.

JANUARY

PRUDENT INVESTMENT METHOD of determining a base for public utility rates firmly established by U. S. Supreme Court (*p. 1*).

GOVERNOR THOMAS E. DEWEY urges New York's treasury surplus of $140,000,000 be set aside for postwar construction (*p. 17*).

INTERREGIONAL HIGHWAY SYSTEM recommended to Congress by President Roosevelt (*p. 69*).

HOUSE COMMITTEE on Rivers and Harbors sponsors bill authorizing 240 postwar projects (*p. 70*).

COLLECTIVE BARGAINING PLAN discussed at meeting of American Society of Civil Engineers (*p. 85*).

NORTH TUBE WORK resumed on Lincoln Tunnel, says executive director (*p. 87*).

BYRD REPORT misleading on construction savings resulting from committee recommendations (*p. 91*).

FEBRUARY

PRODUCERS' COUNCIL recommends 10-point program to Congress to assure maximum employment in construction industry after the war (*p. 151*).

WAR BUILDING program to be completed by the end of June (*p. 151*).

SOO LOCKS set record despite short season (*p. 153*).

SPECIAL TAX provisions for contractors making profit on sale of equipment made under requisition (*p. 157*).

MOSCOW'S NEWEST SUBWAY began operations Jan. 20 (*p. 158*).

PRESIDENT asks approval of 12 special river and harbor projects (*p. 160*).

OIL PROJECTS announced for Middle East area (*p. 165.*)

NEW WATER TREATY signed between U. S. and Mexico (*p. 169*).

SUPREME COURT upholds constitutionality of New York State's redevelopment companies law (*p. 227*).

SCARCITY OF LUMBER poses difficult problem for 1944 (*p. 233*).

BARUCH REPORT favors public works planning for transition period (*p. 235*).

FLOOD CONTROL speeded in four states (*p. 236*).

MARCH

WATER TREATY with Mexico brings strong protest from California (*p. 299*).

OIL LINES across Mexico reported under study (*p. 302*).

NEW POSTWAR ROAD BILL introduced by Congress (*p. 307*).

SAND PUMPING to restore 3½ miles of eroded California beaches (*p. 307*).

PUBLIC ROADS ADMINISTRATION to continue work on Inter-American Highway (*p. 313*).

CONSTRUCTION WORK halted on third set of Panama Canal locks (*p. 315*).

LARGE APPROPRIATIONS for river and harbor projects pass both houses (*p. 376*).

COMPETITION restored on construction, according to Truman committee (*p. 391*).

POSTWAR PLANNERS cautioned about financing projects (*p. 437*).

ROAD NEEDS of south-central states told to House and Senate committees (*p. 446*).

SOME CONSTRUCTION contracts and subcontracts free from renegotiation (*p. 446*).

APRIL

WLB RELAXES specifications to permit use of more steel for construction (*p. 451*).

WAR DEVELOPED construction ideas will aid peacetime public works (*p. 452*).

AMERICAN SOCIETY OF CIVIL ENGINEERS establishes postwar research and development division (*p. 455*).

FOREIGN ECONOMIC ADMINISTRATION drafts plan for training foreign and American engineers for rehabilitation work in liberated countries (*p. 516*).

DEEPENING of lower Mississippi River recommended by commission (*p. 521*).

WESTERN BUILDERS organize to promote their industry (*p. 529*).

CONSTRUCTION RESTRICTIONS on highways eased by WPB (*p. 631*).

WAR DEPARTMENT favors competitive bids instead of cost-plus-fixed-fee contracts for Army work (*p. 631*).

MIDWEST STREAMS near record flood stages in southcentral states (*p. 632*).

GOVERNMENT strikes out at brokers of engineering services on war jobs (*p. 634*).

MAY

MISSISSIPPI RIVER FLOOD breaks 100-year record (*p. 643*).

SANITARY ENGINEERING services active in Central and South Americal (*p. 646*).

FLOOD WATERS recede in Mississippi valley below St. Louis (*p. 710*).

POSTWAR flood-control work totaling $810,000,000 authorized by House (*p. 719*).

U. S. SIGNS new agreement on Niagara River diversion (*p. 720*).

MEXICO WATER TREATY opposed by Nevada as well as California (*p. 724*).

RECLAMATION BUREAU sends Missouri River Basin report to Senate (*p. 769*).

SURPLUS WAR PROPERTY ADMINISTRATION issues Regulation No. 1, governing disposal of surplus war property (*p. 770*).

HUGE POWER AND IRRIGATION plan for Palestine announced (*p. 772*).

CALIFORNIA'S largest hydroelectric plant ready to produce 214,477 hp. (*p. 776*).

CHICAGO sanitary plant gets WPB approval and priority rating (*p. 781*).

JUNE

WPB MAKES further cut in construction materials (*p. 846*).

HOUSE COMMITTEE approves new bill authorizing $1½ billion for roads (*p. 847*).

HOUSE RIVERS AND HARBORS COMMITTEE considers bill authorizing $50 million a year for stream pollution abatement in loans to states (*p. 855*).

TUNNEL holed through on Big Thompson project (*p. 856*).

TWO FEDERAL AGENCIES rebuked by WLB for upgrading construction labor (*p. 859*).

AVIATION ENGINEERS land with Normandy

invasion forces in first 4 hours (*p. 860*).

AFL PLAN for recruiting labor fails to reduce West Coast manpower shortage (*p. 905*).

WPB SETS up new control over all use of lumber (*p. 919*).

CHICAGO awards filter contract for new South District water plant (*p. 921*).

SCENIC HIGHWAY planned along the entire length of the Mississippi River (*p. 924*).

JULY

DEVELOPMENT IN MATERIALS recorded by A.S.T.M. (*p. 1*).

SEVERAL LAWS of engineering interest enacted by second session of 78th Congress, others reported out of committee (*p. 3*).

HOUSTON seeks to buy Federal Works Agency water supply canal (*p. 7*).

COLUMBIA BASIN irrigation project planned for postwar construction (*p. 13*).

MEN may still seek jobs under WMC referral plan (*p. 18*).

ONTARIO ENGINEERS favor own bargaining group (*p. 59*).

ARMY AND NAVY reach agreement with San Francisco on construction within city limits (*p. 60*).

SALARY SCALE for engineers approved by board of direction, American Society of Civil Engineers (*p. 71*).

ARKANSAS COURT approves rejection of low bid by state hospital (*p. 73*).

AUGUST

HOUSE COMMITTEE begins hearings on postwar plans (*p. 123*).

WIND wrecks Mississippi River bridge at Chester, Ill. (*p. 125*).

LUMBER SITUATION improves as war agencies are favored (*p. 189*).

POSTWAR CONSTRUCTION PLANNING too slow for new war tempo (*p. 201*).

FLORIDA COURT DECISION upholds WPB's order L-41 (*p. 206*).

ROAD PLANNING PROGRESS is being made by states (*p. 249*).

ALASKA-SIBERIA tunnel proposed by engineer (*p. 262*).

SEPTEMBER

BUREAU OF RECLAMATION plans $3 billion program (*p. 263*).

WPB HOPES to remove restrictions on building supplies after defeat of Germany (*p. 317*).

FEDERAL WORKS AGENCY survey shows lag in postwar public works plans (*p. 331*).

NEW YORK CITY ready to spend $400 million on 1945 construction if U. S. pays half (*p. 331*).

SENATE cuts postwar highway fund to $1,350,000 for three years (*p. 333*).

RESTRICTIONS relaxed on remodeling large apartments and dwellings (*p. 336*).

MISSOURI VALLEY AUTHORITY proposed by President (*p. 379*).

FEDERAL AID for highways and streets in bill approved by Senate (*p. 385*).

ILLINOIS PROFESSIONAL ENGINEERING license law held unconstitutional (*p. 385*).

SURPLUS PROPERTY board created by new bill (*p. 387*).

BACKLOG of $325 million construction for Canada (*p. 388*).

SIX STATES favor Mexican water treaty now before Senate (*p. 390*).

OCTOBER

ENGINEERING SOCIETY HEADS oppose postwar destruction of German industries, recommend restriction and control (*p. 395*).

MILITARY AND WPB agree construction supplies tight (*p. 447*).

WESTERN CONTRACTORS fear effects of new surplus property act (*p. 447*).

WAR CONSTRUCTION ACCIDENTS reported at less than normal rate (*p. 448*).

COLLECTIVE BARGAINING setup modified by A.S.C.E. board (*p. 461*).

SECRECY lifted on artificial harbors built off Normandy beaches (*p. 461*).

A $4,000,000 FREEWAY proposed for Baltimore (*p. 467*).

NEW CONSTRUCTION BUREAU is set up by WPB (*p. 467*).

EQUIPMENT NEEDS stabilized by changing war pattern (*p. 519*).

LOCAL GOVERNMENTS may be asked to help match federal-road funds (*p. 519*).

FLOATING BRIDGES and concrete caissons are components of two artificial harbors, each consisting of two protected anchorages, used for Normandy invasion (*p. 521*).

E.C.P.D. to undertake accrediting of technical institutes (*p. 525*).

CHICAGO MUNICIPAL AUTHORITY, like Port of New York Authority, considered (*p. 530*).

NOVEMBER

STUDY Cleveland liquid gas fire (*p. 535*).

RUSSIAN ENGINEERS repair war-damaged dam on Dnieper (*p. 537*).

REVISED TUNNEL PLAN for midtown New York (*p. 540*).

PLANS prepared for disposal of federal-aid housing (*p. 589*).

NEW ZONING PLAN voted for New York City imposes additional restrictions (*p. 591*).

ENGINEERS' $741,000,000 FEE is studied in Baltimore (*p. 594*).

DIFFERENCES are reconciled in Missouri River plans (*p. 603*).

EXTENSIVE SANITATION PROGRAMS win approval in California elections (*p. 604*).

ENGINEERING EMPLOYEES in Ontario organize for collective bargaining (*p. 605*).

HOUSE passes highway bill providing $1.5 billion (*p. 665*).

PRESIDENT'S RECOMMENDATIONS call for action on planning funds and Missouri Valley Authority (*p. 667*).

HUGE STADIUM proposed for Washington, D. C., to seat 100,000 (*p. 668*).

ENGINEERS RECOMMEND rebuilding Ohio canal (*p. 668*).

DECEMBER

SENATE, amending House bill, votes more funds for flood-control work (*p. 715*).

STATE HIGHWAY ENGINEERS consider closer cooperation with local units, as result of extension of federal aid to cities and counties (*p. 716*).

HALF BILLION for ammunition plants approved by WPB (*p. 724*).

BILLION DOLLAR national airport plan is presented to Congress (*p. 725*).

CONGRESS completing work on major construction bills (*p. 733*).

FEDERAL GOVERNMENT to share in road right-of-way costs (*p. 787*).

MUCH CONSTRUCTION WORK in Deficiency Bill (*p. 788*).

FEDERAL-AID road bill signed by President Roosevelt on Dec. 20 (*p. 806*).

NLRB forbids status change for men who join collective-bargaining group (*p. 807*).

WPB predicts end of equipment control after termination of European war (*p. 810*).

U. S. Navy photo

The versatile bulldozer, often landed with the first wave of assault troops, has dramatized the manner in which the construction industry's tools and techniques have been applied to effective prosecution of the war.

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SURVEY AND FORECAST—1944-1945

WAR AND ITS DEMANDS ARE UNPREDICTABLE. That was the lesson learned in 1944 when the soothing prospects of year-end victory in Europe suddenly evaporated after months of military effort that was brilliant in execution and optimistic in portent. We enter the new year under circumstances that emphatically re-establish the prosecution of war as our first and major concern. As a result, more effective allocation of manpower is sought, shortages are threatened in certain raw materials hitherto thought ample, and paradoxically, construction of new and enlarged plants for war production is programmed. The latter, involving projects totaling $700,000,000, dramatically demonstrated the unpredictability of war.

Postwar planning and reconversion, which made auspicious gains last year under the illusions of early victory, suddenly became less fashionable topics for discussion or action. However, the fact remains that the longer and harder we fight on the battlefield, the greater become the problems of postwar adjustment. This is the anomalous situation with which we are faced in 1945.

Performance and Promise

DOLLAR VOLUME, a common yardstick of performance, is no measure of the construction industry's accomplishments in 1944. A major part of the industry's manpower, materials and equipment formed part of our military might abroad and there are no published statistics to indicate the total value of this work. Some idea of the tremendous size of this overseas war construction program may be gained, however, from the knowledge that in new equipment and parts alone it called for an expenditure of 800 million dollars, or more than six times the output in 1935, when construction was approximately the same as the 1944 volume.

Within the continental United States the volume of construction, as compiled from *Engineering News-Record* reports, totaled $1,729,753,000. This is 43½ percent below last year's total, and the lowest annual amount since 1935. The reasons are obvious and demonstrate the combined effect of building restrictions, materials shortages as well as the fulfillment of domestic military construction.

What this year promises for the construction industry is contingent, of course, on the war. Domestic construction volume, however, should not fall below that of 1944. When Germany is defeated, with consequent relaxations on materials and manpower, the pent-up demands for needed construction (such as housing and highways) will command quick action. Meantime, the Navy has asked Congress for a $1½ billion appropriation for new construction to keep pace with a vastly expanded operating program; about two-thirds of this amount is for advance base construction material and equipment. The Army has not revealed what its program will cost.

As soon as conditions become auspicious, so far as the termination of the war is concerned, engineers and contractors should not lack for immediate job opportunities. This assertion finds validity in the knowledge that there is a huge backlog of private and public needs, and that substantial progress has been made in postwar planning. For example, at the end of December, 1944, *Engineering News-Record* had listed postwar projects ready for bids totaling $500,000,000 and with another $400,000,000 partially ready. More than $5,000,000,000 in additional projects were in the stage of plans underway or completed out of a total backlog of $16,600,000,000 in identified proposed projects. A few projects, originally reported as "postwar," already have advanced to contract status; these include a $1,500,000 industrial plant in Colorado and a $5,000,000 sewerage and waterworks development in Baltimore. Furthermore, awards are being made to contractors to start work "as soon as priorities are lifted or materials become available."

No Adequate Measure

ACCOMPLISHMENTS that defy evaluation—because there is no adequate measure for the blood, sweat and tears expended in their doing—are the engineering and construction feats performed in the

U. S. Army Signal Corps photo

Global warfare logistics are dramatized in this picture of the arrival of a dis-assembled diesel locomotive in Burma. Shipped from the United States by water and then hauled over the Ledo Road by truck, it is destined for Army service on the strategic Myitkyina-Mandalay railway line.

battle zones. Many of these have not, and probably never will be, recorded. But from those that are documented we gain some appreciation of the scope and variety of the deeds that have been executed. All of them called for ingenuity, stick-to-it-iveness and a devotion above and beyond the line of duty.

No group has earned or is more deserving of an accolade for such achievements than the Navy construction battalions. Unique in that they were organized for the express purpose of speedy utilization of the construction industry's skills and facilities, the Seabees have richly justified their selection for tasks of great difficulty. Not the least of their contributions have been the adaptation of construction equipment to wartime uses. On coral atolls, in tropical jungles and on the beaches of Italy and Normandy they have used the tools of peacetime pursuits with devastating effect on the enemy. And they have readily forged new tools. Thus the Navy's pontoon cell, a typically Seabee product, enabled the Allies to overcome the barrier of shallow water which the Nazis thought gave military protection to Italian beaches. Similarly, the idea of "taking our harbors with us," which was the secret of landing enormous tonnage in short time on Normandy's beachheads, brought to the Seabees an official citation for "contributing materially to the success of the Allied invasion." These highlight accomplishments, along with scores more reported by *ENR* war-correspondent N. A. Bowers and others, give clear demonstration that the Seabees' motto, "Can Do," is no idle boast.

To its long and distinguished record, the Army Engineers added brilliant chapters in 1944. While pushing toward the completion of the Ledo-Burma Road links, the engineer troops also installed an oil pipeline from the docks of Calcutta far into the north Burma jungles in the face of tremendous odds. And in both China and India superhuman efforts resulted in the conversion of rice paddies into Superfortress bases. Islands of the Pacific, as fast as they were wrestled from the Japanese, were turned into major military bases complete with airfields, shops, ports, roads and other facilities in a matter of weeks, and thus were a vital contribution to the spectacular advances in the South Pacific. In France—where Waldo G. Bowman, editor of *Engineering News-Record* is now observing Engineer Corps activities—more than 130 airfields were built in record time, roads, rail lines and ports were repaired and efficient work was done in rehabilitating the Albert Canal in Belgium to serve as an important artery of supply. These are but a few of the exploits that can be credited to the wearers of the "castle," some 500,000 of whom are now serving overseas.

Postwar Planning Objectives

NEBULOUS IN CONCEPT TWO YEARS AGO, the objective of providing an adequate "shelf" of projects for construction in the postwar period is now being achieved both in spirit and fact. Behind the accomplishment lies the promotional efforts of scores of private and governmental agencies coupled with a sympathetic acceptance of responsibility by those in a position to initiate action.

While the construction industry's task is by no means complete, the record for volume thus far is good. This statement is based on the factual evidence that almost a billion dollars of work is now in the ready-to-go stage and another five billion of projects is being planned. Furthermore, these figures do not reflect work contemplated by private enterprise, the announcement and details of which are regarded as confidential.

Gross volume, however, is not the sole criterion by which the overall dimensions of postwar pre-

paredness should be gaged. It is equally important that projects be widely distributed throughout the nation. Surveys show that some sections of the country are lagging in their contributions to the shelf of projects being readied for construction. It is on this phase of postwar planning—securing geographic distribution of work—that special emphasis must now be placed.

Professional Progress

PROFESSIONAL DEVELOPMENTS during 1944 related chiefly to employment conditions and compensation. Of these, the progress made in defining the position of engineers under the National Labor Relations Act, reviewed in detail elsewhere in this issue, was the most important.

About mid-year the American Society of Civil Engineers published its approved salary scale for nine grades of civil engineering work, an event that marked the culmination of several years of exhaustive study. That study already has had considerable effect in raising the compensation of engineering employees to equitable levels. Compensation for consultants also came up for action during the year due to the inclusion of an upper limit of $25 a day for consulting services in some bills passed by Congress. Both the American Society of Civil Engineers and the Institute of Consulting Engineers urged upon Congress the need for setting the limit at not less than $100 in order to obtain the services of men who could not afford to work for the government at the lower fee due to their continuing overhead costs.

The legality of many state license laws was brought into question by a decision of the Illinois Supreme Court holding the license law of that state unconstitutional on several points. As the Illinois law was based on the model law, which forms the basis for the laws of several other states, those laws now are open to similar attack.

Demands for most types of engineering services continued at a high level during 1944 despite the sharp decline in construction. This was due in large part to the high number of engineers in military service, but a considerable amount was the result of advance planning for postwar construction. Notable in the latter operations were the contracts let to consulting engineering firms for plans for superhighway projects.

Educational Trends

ENGINEERING EDUCATION was in a chaotic state most of the past year. In the spring, when the Army increased its manpower requirements, the deferments that had made it possible for some engineering students to stay in college were cancelled and drafting of the deferred men progressively reduced the already small number of engineering students. Military training programs also were cut. These losses were offset in a small way by a new train-

Faster preparation of temporary advance fighter strips was accomplished with the use of asphalt-impregnated burlap in place of the well-known steel plank. The dustproof, waterproof finish is said to give excellent results where a smooth, well-compacted base is available and wheel loads do not exceed 15,000 lb.

ing program for boys under 18 years old and by partial revival of the Army Specialist Training Program late in the year.

Because of these changes, some schools have dropped the accelerated programs that were instituted to meet military needs. However, only a few men are able to avail themselves of these engineering courses.

Engineering educators, generally, are deeply concerned over the negligible number of men now receiving a broad engineering training in contrast to the large number who are getting a smattering of such training as part of their military courses. The latter, they fear, will come out of military service believing that they are fully qualified engineers. To offset the possible bad effects of this condition and to minimize the disillusionment of returning service men, educators are now giving active consideration to postwar programs. They seek, first, to provide the men of exceptional ability with incentives to resume their interrupted training, thus offsetting in part the losses due to war; and second, to give the ex-service men with limited exposure to engineering training a type of special training at the vocational level that will help to make their military experience of maximum value to them.

Obstructive Building Codes

CONCERN is properly expressed by postwar planners over the hampering effect of outmoded, inflexible specifications in existing building codes. Although the intent of a code is to protect the public by stipulating minimum desirable standards, the effect has been to limit design techniques and materials. Unless provision is made now for more flexible codes, construction practice in the postwar period will not be able to derive immediate benefits resulting from the availability of materials, products and methods recently developed. Three remedies are open to communities desiring to throw off these shackles: Building codes can be modernized to permit the use of new designs and materials; or, if that process takes too long, local boards of standards and appeals may be given adequate power to make exceptions to existing codes. Better yet, adoption of the code system now under development in Kansas City might be considered. There the basic code will be a declaration of principle only, while all materials, allowable stresses and permitted methods of design and construction will be carried in appended regulations that can be changed as needed without resorting to the tedious procedure of amending the whole code.

Outlook on Equipment

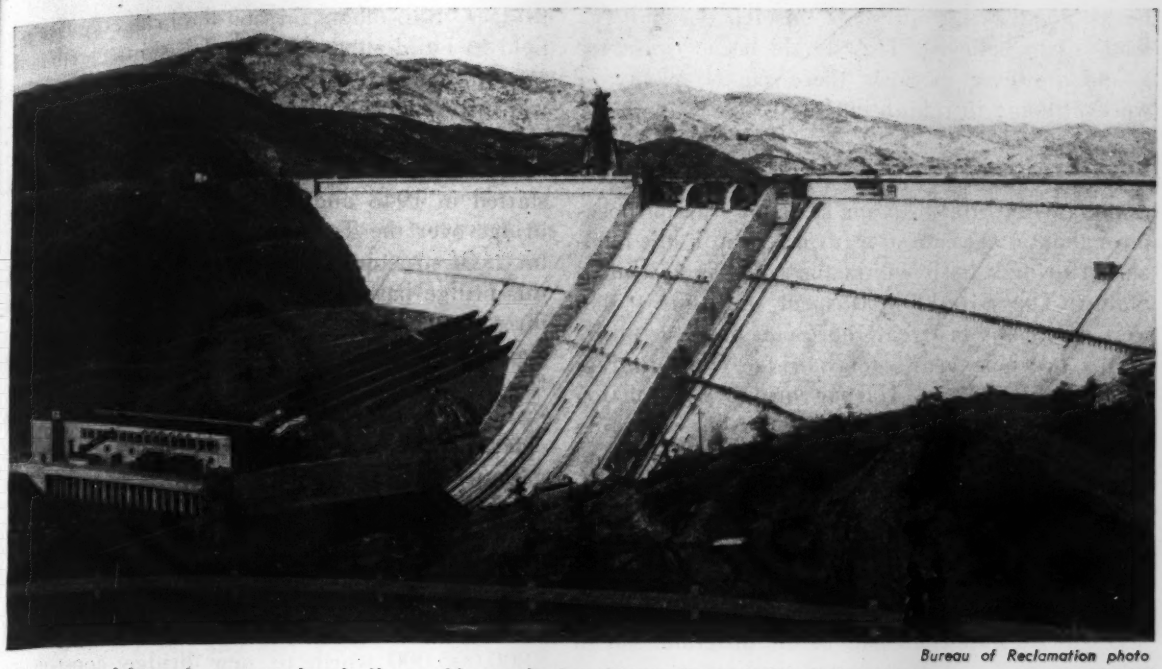
MOST NEW CONSTRUCTION equipment is still being tossed into the war hopper, and no change in this situation is in sight. Yet, when war demands are slackened the equipment industry faces no conversion problem—all it needs to do by and large is to change the shipping tags without even slowing down a lathe or a welder. Fears of a huge surplus of used equipment that will clog the market or get into hands of government agencies and thus become a threat to contracting, appear groundless in view of the way equipment is being expended on both major war fronts. The big stock of army-owned equipment once held in this country has either been rehabilitated and shipped overseas, reduced to junk or is needed for maintenance of army property. Equipment to start postwar construction will come from that in the distribution stock-pile, which is estimated to contain a six months' civilian supply. Maintaining its present rate of production (which is three times normal) the industry can soon catch up with the most optimistic civilian needs. Many equipment features and improvements designed for war use will carry over into peacetime production and, coupled with developments deferred by military production, promise better and more efficient machines than we have ever known.

Rebuilding the World

IT IS NOT UNNATURAL for American engineers and contractors to be thinking about activity in foreign lands as one of the most promising postwar prospects for the application of their talents. Enthusiasm on this score may be rationalized on the basis of what we have already undertaken in almost every corner of the globe. But it must not be forgotten that virtually all of these opportunities and accomplishments were made possible by the exigencies of war at a time when political and economic considerations were of little or no consequence. After the war these and other barriers will become all too apparent, and there is little reason to believe that the major task of rebuilding the world will fall largely to American technicians.

A brief appraisal of the probable postwar situation in major areas of immediate interest reveals these conditions:

Russia—Desires have been created and vast needs exist for American equipment (particularly earth-moving and concrete construction machinery as well as machines for producing building materials) and the United States is presently playing



Bureau of Reclamation photo

Shasta, second largest masonry dam in the world, was hastened toward completion during the year to provide 4,500,000 acre-ft. of storage in the Sacramento River. Key structure in California's Central Valley reclamation project, the dam is 602 ft. high from bedrock to roadway and has a crest length of 3,500 ft.

host to scores of technicians who are studying American practice in virtually every type of industry. The "know-how" sought by the Russians, such as the design and construction procedures for power plants developed by the Tennessee Valley Authority, however, definitely precludes the necessity for inviting Americans to participate in work on Russian soil. Equipment manufacturers should find a market for their products in Russia, but there probably will be no demand for the services of civil engineers, except for installation work.

France—An enormous program of port rehabilitation is being planned, but with the exception of some consultant service and the need for dredging equipment, this task will be handled by French nationals. A critical need exists for housing, which is being met in part by the shipment of new and used prefabricated units from this country. Machines for concrete work are also in demand. But the job of rebuilding France will be reserved for Frenchmen.

China—Vast industrial and public works construction programs exist in theory, but their accomplishment is something that most observers agree will be in the distant future. The Foreign Economic Administration has made a rather detailed inventory of industrial needs and has even gone so far as to have preliminary plans and cost estimates prepared on some projects. However, unless American money is advanced for the construction of these projects, nothing much will be done for some time.

Latin America—Tremendous developments are being planned in many of the countries south of the border, and the war has made possible a huge backlog of dollar-exchange in these countries that will help to bring plans to fruition. Large engineering organizations and exporters of machinery and equipment have reason to feel very optimistic. But the market and the opportunities for the services of individual engineers and small contractors in Latin American countries is generally conceded to be greatly limited.

Detailed and precise information on foreign engineering and business activities can be obtained by consulting the special agencies or missions which have been established in Washington by practically all of the Allied countries. In fact it is necessary that all negotiations be thus initiated. And the factors that will weigh heavily in awarding of foreign contracts will be the size and financial backing of an organization, its "know-how" in a particular field of endeavor, and its past record of activity on an international scale. Few contracting and engineering organizations are in a position to meet these qualifications.

American participation abroad, at least so far as contractors and engineers are concerned, will not

be as great as our present "foreign psychology" leads us to believe. This should be no cause for gloom, however, because there can be plenty of work at home in rebuilding the U. S. A.

Less Bridge Construction

A CONTINUING DEMAND for steel for war purposes throughout 1944 caused a further drop in the number of bridges built within the continental United States. The $16,000,000 spent on bridges that were completed last year represents only two-thirds of the previous year's total bridge expenditures; in fact, since Pearl Harbor bridge construction expenditures have shown a 50 percent reduction each year from a high of $112,000,000 in 1941 to $25,000,000 in 1943. One contributing factor in this diminished program was the completion early in 1944 of the major portion of our military access highway program. Reconstruction of bridges damaged or completely destroyed by floods was of necessity an important part of the program, but in the main, most of the construction activities were confined to highways essential to the war effort.

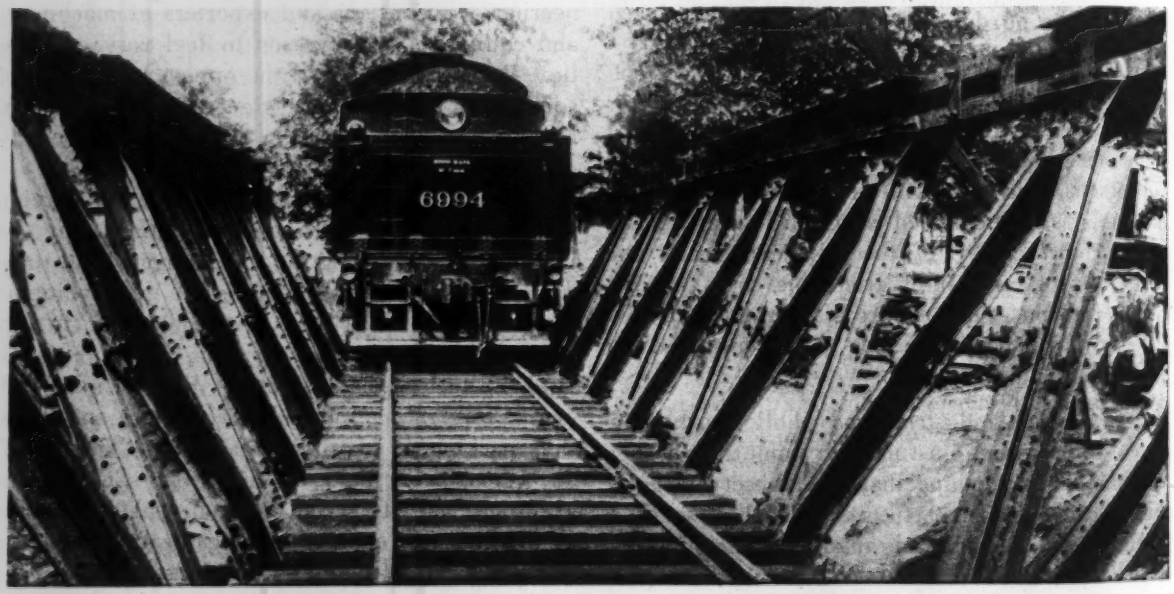
However, the relatively small volume of bridge construction is far from being a measure of the activities of companies normally engaged in their fabrication. With the chief emphasis being placed on military invasion bridges, many shops engaged wholly or in part in this type of fabrication. For example, five different companies concentrated on the Bailey bridge alone. Many others were engaged in perfecting other, more secret, types of military bridges. Still others forsook the bridge-fabricating field to build subassemblies for ships, earth-moving equipment for the battlefronts and many other war-inspired products.

On the Alcan Highway, bridge construction consisted chiefly in the completion of ten bridges started in 1943 and the construction of one new bridge over the Teslin River in the Yukon Territory. Of structural steel and concrete construction, this bridge has an overall length of 1,466 ft. Its three central spans are continuous trusses, so designed that the center 260-ft. span could be erected by cantilevering from each pier. By a requirement of the Canadian government, a 60-ft. vertical clearance was provided above high water for navigation although the only boat that has used this part of the Teslin since the Gold Rush days was one carrying supplies for the Alcan Highway.

Postwar bridge projects were carried forward as fast as limited designing personnel would permit. Nation-wide surveys made early in 1944 indicated $800,000,000 worth of new bridge construction will be needed for postwar highways and $250,000,000 worth of municipal bridge construction.

Bailey Bridges to the Battlefront

FOREMOST AMONG MILITARY BRIDGES of the past year, both in the number fabricated in this country and used on the battlefronts was the Bailey military bridge. Developed in 1940 by the British, this remarkably efficient structure proved so effective in military transportation that its manufacture by



Demountable V-type railroad bridge developed for U. S. Army Engineer construction abroad has a maximum span of 90 ft. By spacing trusses closer and placing floor system on the top chords it can be erected as a deck truss span.

American bridge companies was launched in great volume long before any publicity was released regarding its use. The veil of secrecy surrounding it was lifted, however, early last summer.

Included among its many virtues are simplicity and speed of erection, as well as its adaptability in carrying heavy loads or spanning great lengths by assembling standard truss sections in combinations of one, two or three each side of the single-lane roadway, and in single, double or triple tiers. Post-war prospects are that many rivers in conquered lands will be spanned by Bailey bridges of all lengths and combinations. As to its use in this country after the war, there is little probability that it will be found economical since its fabrication cost, even on a mass production basis, is more than twice that of ordinary steel bridges.

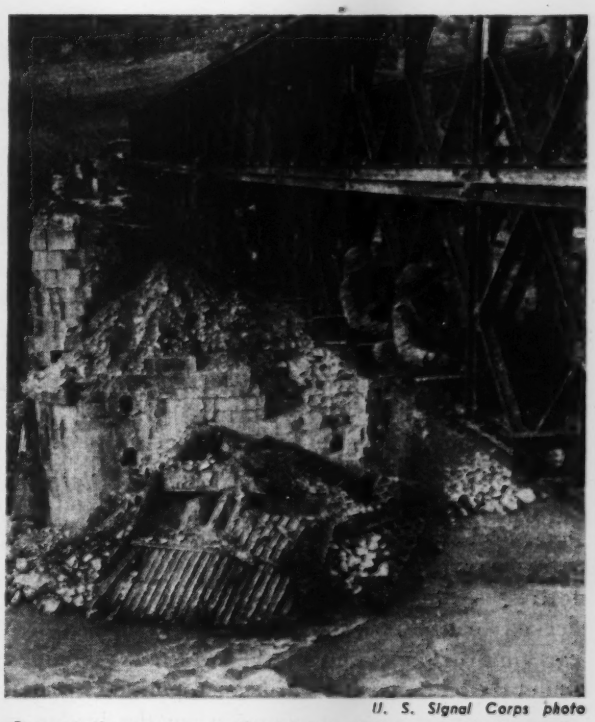
Military Railroad Bridges

SEVERAL OUTSTANDING TYPES of military railroad bridges have been, and are being developed. Although the demand for such structures has been considerably less than for the Bailey bridge, they nevertheless continue to play a vital role among our invasion armies. Of those which we are permitted to discuss, the Unit Construction Railway bridge, also developed by the British early in the war and fabricated in this country during the past several months, has met with unusual success for combat needs. This precision-built Pratt-type truss can be quickly erected as a through or deck bridge in span lengths up to 85 ft. Field erection is by bolting or pinning the component parts.

Another outstanding military railroad bridge is the Demountable V-Type bridge developed by the Fort Pitt Bridge Works for replacement of demolished structures of 40 to 90-ft. span. Designed for Cooper's E-40 loading, this lightweight truss has four main duplicating parts none of which weigh more than 400 lb. It can be erected either as a through or deck type bridge. Basically, it has a triangular cross-section, i.e., one lower chord on the centerline of bridge and two upper chords flared out to form a V with each truss connected by an inclined Warren-type web system.

Timber Bridge Construction

WARTIME EMERGENCIES at first appeared to offer a great opportunity for heavy timber bridge construction. Priorities were clamped so quickly on steel that timber was seen as the logical substitute on various types of heavy construction, but small advantage could be taken of this situation because



U. S. Signal Corps photo

One of the most versatile pieces of Army Engineer equipment is the Bailey bridge whose interchangeable units make for speedy erection. This installation in Italy is being given a final check to insure safety for the heaviest loads.

lumber mills were soon loaded to capacity with more urgent war orders. Before this situation became critical, however, some wartime timber bridges had been built. One striking example is the Albion River Bridge on the California highway system. This large structure of the viaduct type harks back to the era before steel and concrete had gained popularity.

Meeting wartime needs has put greater emphasis on modern advances in the use of timber, such as prefabrication, laminated construction and the use of ring connectors to get more efficient joints. These all tend toward making timber structures more dependable and with less need for maintenance in long service. Nevertheless, some designers have disregarded well known principles in the proper use of timber with the result that timber construction has lost some friends among users.

All these factors have a bearing on the competitive standing that timber will have with respect to other construction materials when manufacturing practices get back to "normalcy" after the war.

Movable Bridges

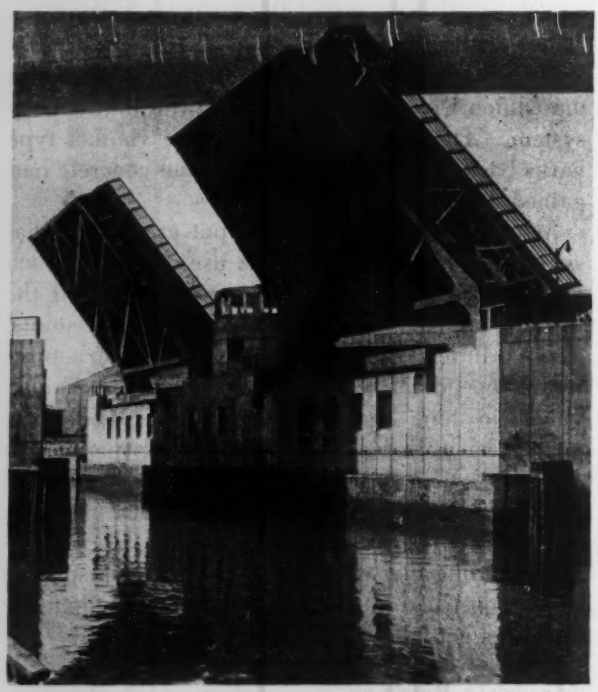
IN THE FIELD OF MOVABLE BRIDGES the outstanding structure of the year was the skewed bascule bridge over the Gowanus Canal at Hamilton Ave.

in Brooklyn, N. Y. Conceived by Clinton D. Hanover, Jr., chief of the bridge design bureau, New York City, this twin single-leaf bascule has proved both economical in construction and efficient in operation. It is reported to have saved $300,000 over the next most feasible layout.

Adoption of this bold design in movable bridges followed extensive studies aimed at securing a practical and economical bascule bridge which would incorporate all worthwhile features of a normal bridge of this type and eliminate the several bad features usually inherent in skewed bascules.

Another innovation in bridge design was a floating deck truss bridge built by the Austin Company to serve as a taxiway between a Boeing Aircraft Co. plant and a take-off runway located on the opposite side of a navigable stream. Built as a wartime expedient in the construction of superfortresses, this 85-ft. long, 110-ft. wide timber decked bridge rests on concrete abutments when carrying B-29's. Twelve large steel tanks mounted under the bottom truss chords and operated by compressed air provide buoyance when the bridge is being floated aside to permit the passage of waterborne traffic.

While this particular type of bridge has little or no postwar application, it illustrates the ingenuity of engineers faced with an unprecedented problem in bridge design.



An innovation in bridges is the "knee-girder" bascule for skewed crossings, which was built by New York City at the Hamilton Avenue crossing of Brooklyn's Gowanus Canal. It provides a clear span over the entire channel width, has equal trunnion loads and parallel channel piers.

Outstanding among the "things to come" in bridge design is the proposed 4-level freeway intersections in Los Angeles to carry San Francisco-San Diego through traffic across the Arroyo Seco Parkway route from Pasadena to San Pedro. Reflecting an innovation in grade separation practice, this compact layout accommodates a total of 22 traffic lanes varying from 22 ft. below ground level to about 47 ft. above ground. In view of the many urban and city expressways being planned for immediate postwar construction, such grade separation structures may become relatively commonplace after the war.

Chester Bridge Failure

FAILURE OF TWO 670-ft. continuous truss spans of the two-lane highway bridge over the Mississippi River at Chester, Ill. during a severe windstorm last July points to the necessity for intensive investigations of wind pressures on similar structures. Factual evidence at the site of the disaster indicated little else than that the trusses failed by a combination of uplift, longitudinal movement and transverse overturning.

Unlike the Tacoma Narrows Bridge, which was characterized by innovations in design, the two-year old Chester Bridge marked no departure from accepted bridge design standards. Hence this accident points emphatically to the need for substituting rational wind design theories based on exhaustive research for our present empirical formulas.

Research By Wind Tunnel

ONE BRIDGE RESEARCH PROJECT stands out in 1944 as probably surpassing anything heretofore undertaken in this field. This is the precision study carried on at Seattle with suspension bridge models in a specially built wind tunnel having a 100x10-ft. throat. This work has been conducted on a par with other aerodynamic wind tunnel studies in the matter of precision. It has used models built at a cost of about $20,000 each for scale measurement in terms of: (1) linear dimensions in all three planes; (2) weight; and (3) resistance to vertical, horizontal and torsional movement.

After only two years of experimental work conclusions and ultimate findings cannot be announced as there are yet many fundamentals to be investigated. However, results thus far prove the necessity for aerodynamic stability in long-span bridges that are to be safe from harmful or destruc-

tive oscillation set up by winds. Even though no findings or final conclusions have thus far been announced, these studies have focused the attention of bridge engineers on the subject of aerodynamic effects on bridges. Witness the current construction of fourteen vertical vibration recorders for tests on several long-span bridges throughout the country, particularly on the golden gate bridge at San Francisco.

Although the Seattle studies are still incomplete it is already apparent that engineers must henceforth reckon with this new factor in the design of long-span bridges.

Much River Work Planned

AN EXTENSIVE PROGRAM of flood control and river development has been advanced to the point where much work can be put under way soon after Congress appropriates funds and removes or eases current restrictions on construction not directly connected with the war. Late in 1944 Congress passed a flood-control bill authorizing expenditures of over one billion dollars. A major part of this authorization is $400,000,000 for the start of work on a coordinated development of the Missouri River.

Work covered by this bill plus that included in the rivers-and-harbors bill now in Congress brings to nearly four and one-half billion dollars the projects which have been studied by the Army engineers and reported favorably to Congress. Of this, detailed plans for a half billion dollars worth of work have been advanced to the point where contracts could be let in a short time, after clearances are received. In addition, a large volume of work that was shut down since this nation entered the war could be restored to active status quickly when war restrictions are raised.

Missouri River Development

TWO PLANS for coordinated development of the Missouri River basin were laid before Congress in 1944, one prepared by the Army Engineers and one by the Bureau of Reclamation. Congress also had laid before it plans calling for creation of a Missouri Valley Authority, similar to the Tennessee Valley Authority, to develop the river's water resources independent of existing federal agencies.

Although this latter plan was endorsed by President Roosevelt, Congress did not approve of it. Instead, Congress instructed the two federal agencies to review their plans jointly and report to it on a cordination of the two plans. The outcome was a proposal calling for an ultimate expenditure of $1,258,000,000. Work primarily related to irrigation is to be handled by the Bureau of Reclamation, and structures for navigation or flood control are to be built by the U. S. Engineer Department.

St. Lawrence Seaway

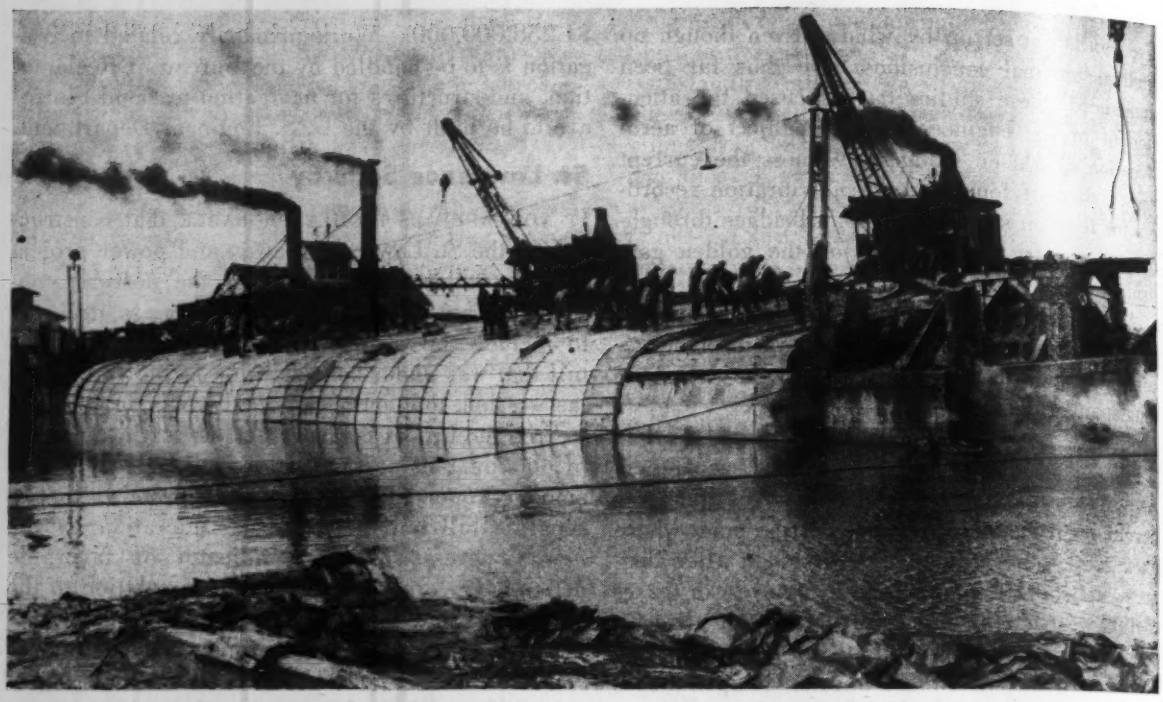
IT NOW APPEARS HIGHLY PROBABLE that construction of the St. Lawrence seaway and power project will be undertaken as part of the postwar construction program. Although Congress declined to include the project in the rivers and harbors bill that was under consideration at the end of the last session, that action was taken only in an effort to free the bill of controversial issues in the hope of obtaining its passage before the end of the session. Proponents got a virtual promise that a separate bill will get early consideration by the new Congress. Another indicator of favorable action is Governor Dewey's recommendation to the New York State legislature that the state undertake the work if the federal government does not act.

If the federal government does act, it is hoped that action will not be taken until the 1941 agreement with Canada is revised. That agreement was defective in its provisions relating to the division of waters for power at Niagara, for its failure to cover the question of power export, and for the outmoded dimensions it set for the canal and locks.

Record Floods and Droughts

MAJOR FLOODS in 1944 exceeded the 1943 flood records in the Mississippi Valley and in several other drainage basins. Relatively close succession of floods of such magnitude is authoritatively rated as "extraordinarily unusual." The Mississippi reached the highest stage in a 100-yr. period in April 1944 when the crest topped 39.1 ft. at St. Louis, Mo., the highest since the 41.4 ft. crest of 1844. As the 1943 crest at the same location reached 38.9 ft., this stands as a striking example of record floods in succeeding years. Worthy of note is the fact that the *volume* in these floods was well below the record, indicating that much higher crests are possible.

Similarly, many small streams in the Mississippi basin approached or exceeded record stages. New flood heights and record discharges were attained in 1944 by the Neosho River in Kansas, the St. Croix in Wisconsin, the Skunk and Des Moines in Iowa, the Elkhorn in Nebraska and the Sabine and Neches in Texas. The Maquoketa River in Iowa nearly doubled its previous 30-yr. record. Several 1944 floods were notable in rate of runoff. In the vicinity of Bagnell Dam, Missouri, streams with



Record-breaking floods last spring called for emergency construction measures. Shown here is a bank protection operation on the Mississippi at Goodrich, La., where an articulated concrete mattress 3,000 ft. long was installed in 20 days despite high water and the prevalence of swift currents.

drainage areas of 5 to 25 sq.mi. discharged at rates of from 800 to 1,500 cfs. per sq.mi. In eastern Maryland peak discharges of the North River reached about 500 cfs. per sq.mi.

On the Columbia River the second lowest flow since 1878 was recorded for the year ending Oct. 1, 1944, with a total volume of 87,700,000 acre-ft. The discharge was 61 percent of normal and the average flow was only 120,800 cfs. The spring peak flow of 325,000 cfs. also was unusually low, there having been recorded only four lower spring peak discharges. The annual flow at Grand Coulee was the lowest in 30 yr. and in one of the tributaries, the Spokane River, the runoff was only 42 percent of normal, the lowest in a 52-yr. period. In the southeastern states, also, flow was subnormal, leading to critical conditions when municipalities made excessive drafts on stored supplies.

Reports from 35 representative irrigation reservoirs showed heavy drafts on cyclic storage. Fortunately, storage was generally high in 1943, according to U. S. Geological Survey figures, and reserves carried over into 1944 made it possible to supply irrigation needs without too serious a drawdown. However, continued runoff deficiencies could be serious.

During 1944 the total pumpage of groundwater exceeded the previous record made in 1943. Serious and in some cases critical conditions resulted from the continued withdrawal of groundwater by Army and Navy establishments, industrial plants and public water-supply systems whose demand was swollen by war industries. Declining pumping levels increased pumping costs and the encroachment of saltwater threatens in some areas. It is generally agreed that these situations deserve, and some are now getting, special consideration to determine what remedial measures may be effective and whether eventual curtailment of pumpage may be necessary. In Louisville, Ky., for example, some industrial wells were recharged with city water during the winter season when demands on the municipal surface supply were not great.

Some of the areas in which groundwater conditions are in the more critical stages, according to the U. S. Geological Survey, are: Brooklyn, N. Y.; Philadelphia; Baltimore; Savannah, Ga.; Mill Creek Valley, Ohio; Louisville, Ky.; Peoria, Ill.; Chicago; Memphis, Tenn.; Norman, Okla.; Baton Rouge, La.; Los Angeles; Houston and El Paso, Texas.

Reclamation Bureau Activities

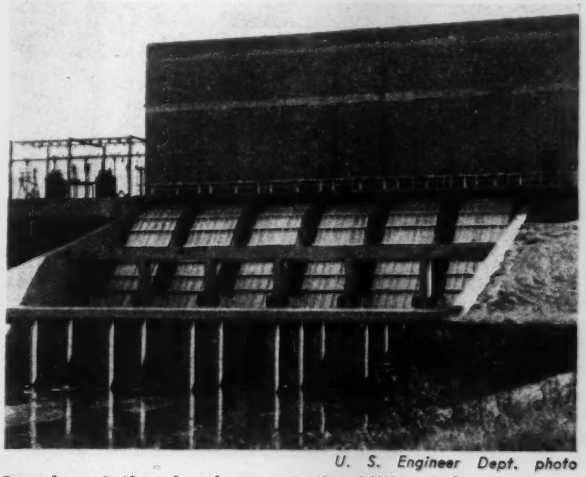
WORK on major irrigation projects last year was slowed to about half the amount done in pre-war years—about $50,000,000 as compared to about

$100,000,000 three years ago. Moreover, work that was done decidedly reflected the war influence. For example, activity of the Bureau of Reclamation was rationed on a priority list about as follows: In class A-1 was placed work on those major irrigation projects (totaling 14) that were related to the production of food. Into class A-2 went that work dealing with power generation or transmission, all of which is presumed to have essential application. Miscellaneous emergency work was placed in class A-3, and the A-4 list was headed "Special Postwar," that is, projects which in some way relate to immediate postwar readjustment. In this class is the Columbia Basin project. The chief value of that project lies in the land-settlement opportunities that it will provide.

Some reclamation work, both in the planning and the construction stages, was halted in 1944 because of manpower shortages and possible interference with the war. Still more work may have to be shut down or materially slowed in the near future because of these shortages. In this class are the Colorado-Big Thompson and the Anderson Ranch projects.

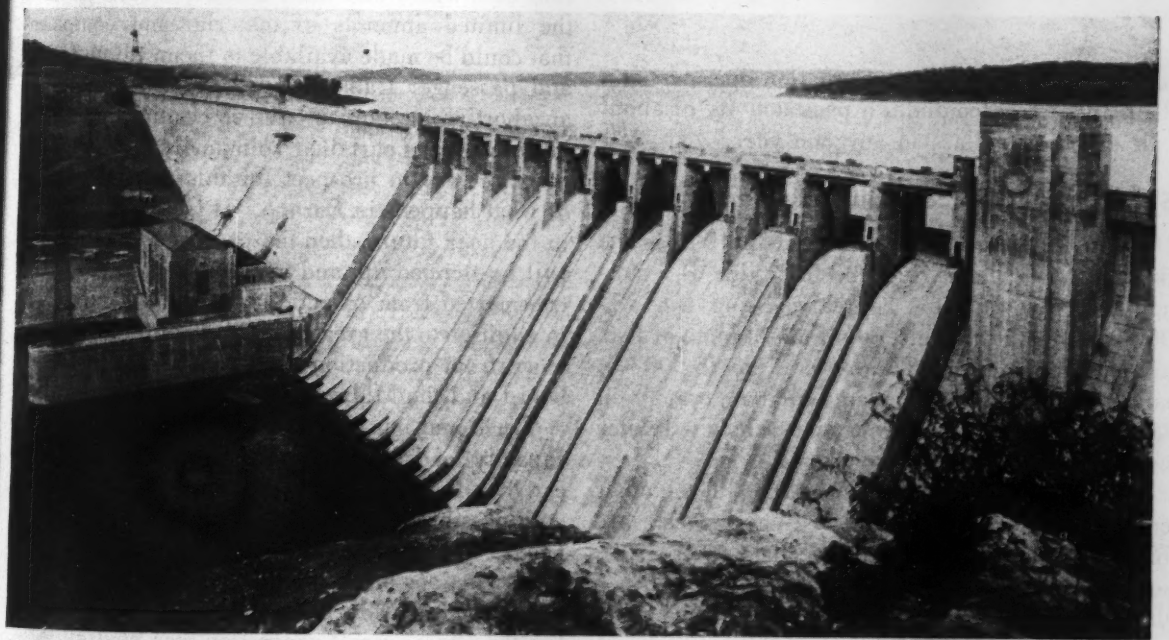
Meantime, attention has been given to a postwar program with a view to being ready for V Day on one or both fronts. The broad objective has been to lay out a construction program that would about double the annual expenditure of 1944 (i.e., a total outlay of about $100,000,000 per year) after V Day on one front, and provide some four times that amount or almost $200,000,000 per year after V Day on both fronts.

The foregoing refers to plans for immediate initiation and is in addition to long-range postwar planning. This latter, related to a six-year or longer period, was presented to Congress last June, as a three-billion dollar program. Projects in this program are well distributed over the seven regions



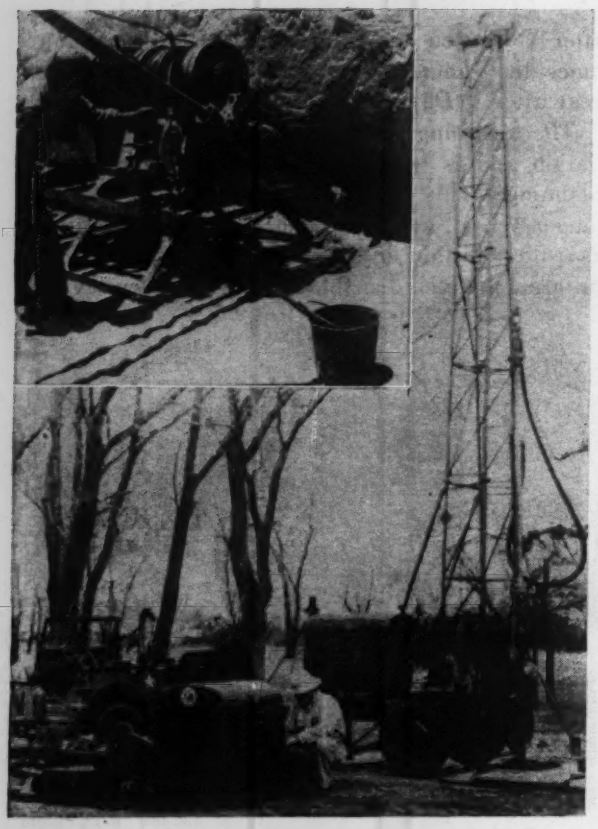
U. S. Engineer Dept. photo

Pumping station forming part of additional flood protection facilities at Memphis, where war industries are located. Six 500-cfs. pumps are installed for the removal of drainage water behind the levees, in addition to three units of 2,000 gpm. capacity for domestic sewage.



U. S. Engineer Dept. photo

Flood control and power production are the dual functions of Norfork Dam on the North Fork River in Arkansas. Completed late in 1944, this structure rates the distinction of being our seventh largest dam; it has a maximum height of 242 ft., is about 2,600 ft. long and contains 1,500,000 cu. yd. of concrete.



Capable of drilling a 4-in. dia. well to a depth of 500 ft., or of drilling a 10-in. auger hole for demolition purposes, this swivel-type hydraulic rotary drill equipment was designed for air transport in war zones without disassembly. Insert shows a skid-mounted unit making an angular exploratory boring.

in which the Bureau of Reclamation operates, and the planning contemplates a peak activity of about half a billion dollars in any one year.

Shasta and Central Valley Projects

ONE NOTABLE PROJECT completed in 1944 is the 602-ft. Shasta Dam. Here the full value as a storage reservoir can now be realized and two 75,000-kw. generating units, out of an ultimate of five, are now in operation. Two more of the 75,000-kw. units intended for this plant are temporarily in service at Grand Coulee Dam whence they will later be removed and brought to Shasta.

Irrigation benefits from Friant Dam, at the other end of California's Central Valley project, are limited to the area north of the dam that can be served by that portion of the Madera Canal between the dam and the Fresno River, which is now in service. The total 40-mi. length of this canal serves an area relatively small as compared to the $10,000,000 Friant-Kern canal some 125 mi. long whose construction southward from Friant awaits postwar release of manpower and materials.

Interstate and International Waters

EARLY IN 1944 representatives of this country and Mexico signed a treaty that undertakes to settle for all time the questions over waters of the Rio Grande and Colorado that have been at issue between the two countries for many years. An acceptable solution of questions relating to the Rio Grande appears to have been found, but the same cannot be said of the Colorado. There, California and Nevada are opposing the proposed settlement, while the other states appear to find it equitable. What the outcome will be is unknown because the U. S. Senate did not begin its consideration of the treaty until late in January of this year.

Also unsettled is a controversy between the states of Nebraska and Wyoming concerning waters of the North Platte. A special master made a voluminous report to the U. S. Supreme Court on that case in October which appears to call for little change from conditions as they existed when the suit was begun by Nebraska ten years ago. The Supreme Court now has the 25,000-page report under consideration.

Greater Transportation Load

RAILROADS HELD THE SPOTLIGHT in the transportation field again last year, doing a record job with the limited amounts of material and equipment that could be made available to them. Both freight and passenger traffic increased, the latter despite an abortive attempt to have conventions and other large meetings curtailed voluntarily. Still greater increases are in prospect for this year, regardless of what happens in Europe. If Germany collapses in the near future, then the pace of the Pacific war will be stepped up, and men and material must be transported from Atlantic ports to the Pacific Coast in addition to the greater bulk of supplies that must move from production centers of the Atlantic seaboard and the Midwest.

Truck and bus operators also continued to carry capacity loads during 1944, and like the railroads, can look forward only to greater demands in 1945, with possible replacements far below their obvious needs.

Restrictions on civilian use of air transport were eased somewhat during the latter part of the year, but the effect on rail congestion was negligible.

Air transport has begun active planning for the postwar era, major attention being centered on

intercontinental routes. To this end representatives of 39 nations met in Chicago late in 1944 to lay the groundwork for a world-wide air transport system to be inaugurated as rapidly as war conditions will permit.

Indicative of what the future may bring was the new commercial flight record of 14¼ hours New York to Europe set by American Export Airlines on October 23. That airline has now been making commercial flights to Europe for two years. It and other lines plan rapid expansion as soon as war conditions will permit an increase in commercial flying activities.

Large Airport Program

HERE AT HOME, plans for greatly expanded air transportation after the war took concrete form late in the year when the Civil Aeronautics Administration sent to Congress a proposal to improve 1,625 existing air fields and to build 3,050 new fields. Costs are estimated at over one and one-quarter billion dollars.

The Class 1 airports, those designed primarily for personal flying, are to be increased from 981 to 2,597, and the Class 2 field, suitable as feeders for main airlines as well as for personal flying are to be increased from 810 to 2,198. Much smaller increases in the number of larger fields are called for as present plans do not contemplate adding many long distance airlines. More frequent and better service on those lines is planned, supplemented by short feeder lines.

Airport Operating Costs

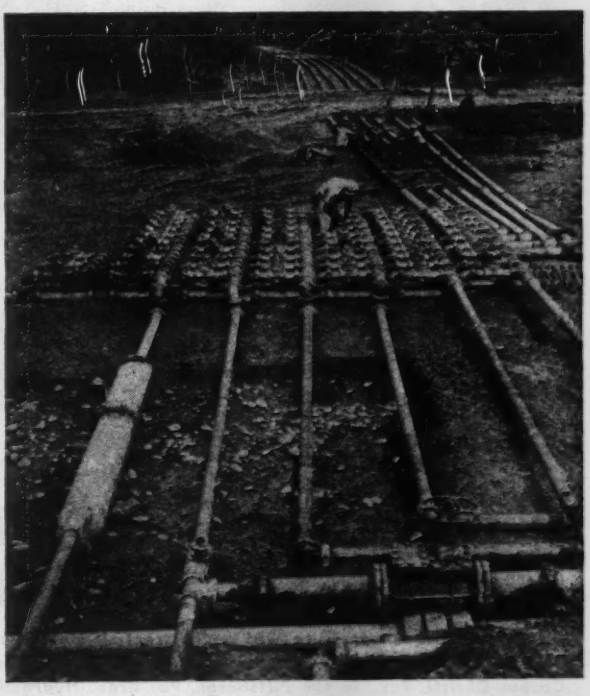
PLANNING for this expanded airport program has been stimulated by the belief that planes are to be about as cheap as autos after the war. But even if planes are that cheap, communities that are planning to provide their citizens with fields from which to fly those planes need to recognize that the cost of operating an airport is far from cheap. If those communities are to avoid financial headaches in the postwar era they need to give thought to how such fields are to be made much more nearly self-supporting than they were before the war.

Back in 1938 the American Society of Planning Officials in conjunction with the American Municipal Association published a report titled, "The Airport Dilemma". A study of this report today, which reviews the experiences of municipalities that undertook the construction and operation of airports, provides some information that will be found useful and sobering in contemplating similar enterprises for tomorrow. Past experience indicates, with few exceptions, that airports are not self-supporting. The situation in 194X may be different, but until the answers are obtained to a number of unknown factors, community airports should still be considered as one of the luxury type of public service facilities.

Looking Ahead in Highways

MOST THINKING ABOUT HIGHWAYS in 1944 was concerned with the future. This was due in large part to the fact that bickering over federal legislation to provide for a greatly expanded federal-aid highway program immediately following the war delayed final action on that legislation until the end of the year.

The Federal-Aid Highway Act of 1944 provides half a billion dollars of federal aid for each of three years following the war, to be matched equally by the states, counties or cities receiving the funds, thus providing for a potential road-building program of one billion dollars in each of those years. This marks a new high in such work. So large an amount is amply justified by the accumulation of needed road construction postponed by the war. It has the added advantage of providing a large reservoir of peace-time work that can be put under way quickly.



Oil pipeline extraordinary is the 2,000-mi. long military installation from Calcutta, India, to the North Burma front. When completed into central Yunnan it will supply China with liquid fuel through the longest pipeline in the world.

New in the postwar program are the provisions for making part of the federal aid available for highways into and through cities and for county roads that are feeders for the state systems. Legislation is needed in many states to make these provisions fully effective. The funds are to be handled through the state highway departments.

Interstate Highways

ALSO NEW in the 1944 highway act is the requirement that the states acting jointly shall designate a national system of interstate highways not exceeding 40,000 miles, which if not already a part of the federal-aid system shall be added to that system. Development of such a system of limited-access highways built to high standards was recommended to the President early last year by the National Interregional Highway Committee.

That committee did not recommend the construction of an entirely new network of superhighways independent of the existing federal-aid system, as has been advocated in legislation introduced into Congress from time to time in the past by people having little knowledge of actual highway needs. The committee proposed instead that a system of interregional highways be developed as an integral part of the existing system by rebuilding existing roads to modern superhighway standards or by building new highways where such modernization appears to be impractical or undesirable. The new act makes possible a start on such a system.

Gas welding under pressure was a construction innovation on the 24-in. natural gas pipeline extending 1,260 mi. from Corpus Christi, Tex., to the Pittsburgh, Pa., area. Hydraulic cylinders concealed in the maze of pressure and gas-carrying hose, made it possible to "stovepipe" lengths of pipe, the ends of which are instantaneously heated by oxy-acetylene jets and simply pressed together to make the weld.

Little Road Construction

NEW ROAD CONSTRUCTION during 1944 was at a low ebb. Most of the highways required for access to war plants had been completed before the year opened and the only new work that was permitted to go ahead was that on highways serving areas of intense war activities where the inadequacy of existing roads hampered the war effort. Outstanding among these projects was the Detroit Expressway.

Because of the reduced construction, highway maintenance operations were at a high level. An increasing amount of this work was let to contract during 1944, following a practice inaugurated earlier on an experimental basis due to loss of maintenance men to the armed forces or war industries. The plan is said to have sufficient merit to warrant its continuation, thus opening up a new field to contractors.

Inter-American Work Continues

WHILE RESTRICTIONS on highway construction were continued throughout 1944 in this country, unless the work was essential to the war effort, a considerable amount of work on the Inter-American Highway was carried forward, in part with funds supplied by this country. Of the 3,356 miles of the Inter-American Highway from the Texas border to the Canal Zone, 2,328 miles now are in condition for all-weather travel and 87 more miles are passable except in bad weather. Construction of 426 more miles is under way and work on 515 miles remains to be started.

Forces under the immediate direction of the U. S. Army Engineers were withdrawn in October 1943, but work under the direction of the Public Roads Administration was continued. The abandoned program of the Army Engineers in most instances is now being carried forward by the road department of the country in which the work lies, with financial aid from this country and PRA supervision. Thus, in Guatemala, $800,000 of

construction equipment belonging to the Army Engineers was turned over to the local government for road work.

Under the direction of the PRA, an American contracting firm is at work on a 73-mile gap in this highway in the northern part of Costa Rica and a 71-mile section in the southern part of that country. The latter is through very difficult terrain, across which it is expected that the pioneer road will be opened early this year.

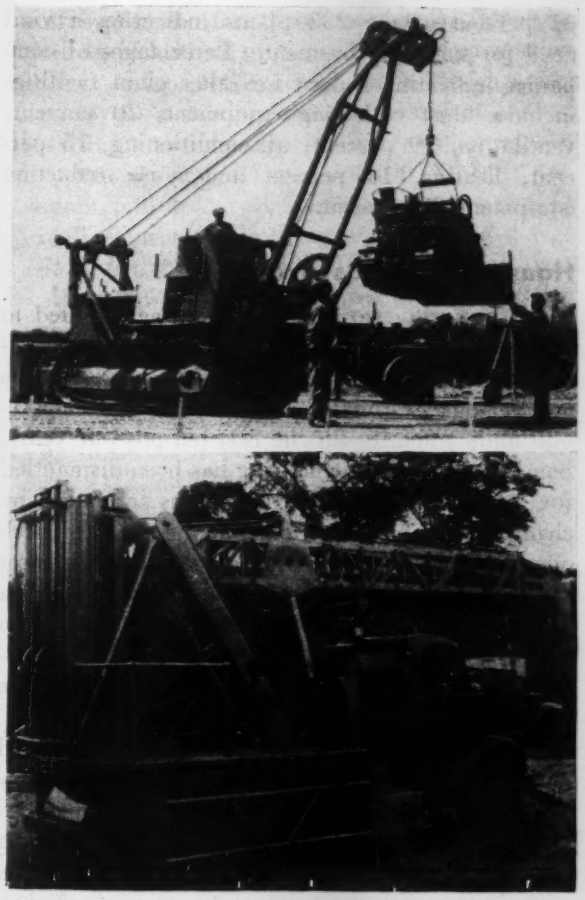
In South America, the Public Roads Administration has survey crews at work on a 300-mile section of the Pan-American Highway system in Bolivia and is providing engineering supervision for the first section to be put under construction. A 90-mile section of the same system was completed in Ecuador last year, and lesser amounts of work are in hand in other countries. In South America, as in Mexico, no United States aid is supplied, except the loan of the PRA engineers to Bolivia.

Industrial Building Outlook

DESPITE CONSIDERABLE TALK about conversion of war plants to peacetime production there is good reason to believe that industry intends either to expand existing plants or build new ones designed for maximum manufacturing efficiency. Increased efficiency is one of the means by which industry can produce goods at sufficiently low unit costs to meet postwar competition and thus maintain a high level of employment. The ordinary plant built for wartime volume production alone, without regard to operational efficiency, has limited usefulness in peacetime production.

Manufacturing processes as a whole are not nearly as modernized as they should be. Prior to 1929 not enough attention was given to efficient production. Then came the depression and industry did not have the funds or the incentive to modernize its plant. This was followed by the war years where volume production was the primary issue and further plant modernization by industry in general was postponed due to lack of materials, labor and time.

The present trend is to design the service structure of plants around the manufacturing process involved, rather than to acquire huge war plants which cannot easily be adapted to specific needs. Another factor influencing plant layout is the trend towards providing better working conditions. Better lighting is one of the prime requisites, followed closely by improved ventilation or even air-conditioning, as well as greatly improved employee service facilities. More efficient handling of materials being processed also commands the attention of designers.



The beach-dozer (top) equipped with rear-end crane and armored protection for operator, is one of the first machines ashore in amphibious operations. Shown below is a newly developed six-ton all-hydraulic crane, powered from the engine of the 1½-ton truck on which it is carried; the rig has full-circle swing and a boom that can be extended from 19 to 31 ft. by a single hydraulic ram.

An insight into industry's postwar plans may be gained from a recent survey conducted by *Factory Management and Maintenance* in which 233 plants of various sizes were contacted. This survey reveals that 18 percent consider the building of a new plant as an absolute necessity; 12 percent believe they should have new plants and 9 percent report a new plant would be desirable. In contrast, only one percent report definite plans to purchase a government-built plant after the war; three percent indicate they may do so and 12 percent say it would be desirable. Fourteen percent of the companies report they plan to rehabilitate their present plant structure and 22 percent propose to get along with existing facilities.

Better lighting facilities are in greatest demand,

31 percent of the 233 plants indicating a vital need for such improvement. Percentages of companies indicating a need for other plant facilities include: dust collecting equipment, 20 percent; ventilation, 19 percent; air-conditioning, 15 percent; heating, 14 percent and noise reduction equipment, 12 percent.

Housing Demands Are Big

WITH CONSTRUCTION of new dwellings limited to critical needs in overcrowded war areas, the backlog of housing demand grows ever larger. It is now variously estimated at from 900,000 to 1,600,000 units annually for the first ten postwar years. Some emergency type housing has been dismantled for re-erection at other locations dictated by changes in war production, but the scale of such operations has not been large. Perhaps the most significant move in this direction was the shipment to France of temporary shelters that had been declared excess. Eventually, the National Housing Agency must arrange for the disposal of some 800,000 publicly financed dwelling units.

War-stimulated public interest in prefabricated houses has tapered off temporarily, but the industry is making ready for active participation in the postwar market. In this connection, emphasis is being placed on perfecting marketing and distribution organizations for the product, since mass production techniques no longer constitute a problem.

Construction Developments

DESPITE the lowest construction volume since 1935, some notable achievements and developments in construction during the past year deserve mention. Internal vibration of the thick concrete paving slabs that are necessary to carry the heavy load concentrations of the huge bombers has had successful trial. Concrete for a 100-ft. dia. dome was successfully placed over an air-inflated fabric bag after the initial attempt was interrupted by failure of the fabric.

Cement grouting of railroad roadbeds has met with such success that the Santa Fe has treated upward of 100 miles this year. A method of solidifying sandy soils by vibration and water flotation has had successful field trials, and tests indicate that it may be possible to increase the bearing power of some soils sufficiently to eliminate the necessity for piling.

Welding of the scroll case for the power units at TVA's Fontana Dam marks one of the first departures from riveting for field assembly for large hydraulic structures. Gas pressure-welding of a 24-in. dia. natural gas pipeline gives promise of a new and economical procedure. Underwater cutting of steel by the electric arc has been developed to the stage of a widely useful construction tool. Removal of steel from the wrecked Chester Bridge over the Mississippi River was speeded by use of high velocity dynamite placed at the panel points, entirely eliminating necessity for underwater cutting in the turbid river.

In making a deep rock cut for the Steep Rock river diversion work in Canada, large saving in explosives were made by driving a tunnel along the center line of the invert from which radial holes were drilled and fired in advance of the firing of holes drilled from the surface.

Of interest to construction men is a newly developed hydraulic-powered truck crane, admittedly not as fast as the winch-powered crane but good for most lifting uses and much lower in first cost than conventional units. A wheelbarrow made of magnesium brings the idea of weight-saving metal right down to the man who carries the load and perhaps opens for review the entire field of manually handled tools.

Much small construction equipment has been built to sizes that can be transported by air and has been successfully used on all of the battle fronts and in remote locations. However, current preference seems to be for use of standard size equipment, made transportable by air by cutting it into sections that can be handled and reassembling at the destination by welding.

Military Construction

CONSTRUCTION by military forces in the forward areas continues to be characterized by the type of ingenuity that always is displayed by experienced construction men when faced by a difficult situation without adequate equipment. Outstanding among such operations are the artificial harbors on the Normandy coast designed and built by the combined efforts of British and American engineers. Less spectacular but still of great military importance has been the perfection of methods for using both normal construction equipment and specially built military equipment to facilitate landings.

Airfield construction in advanced areas also has been characterized by notable improvements in methods that are the outgrowth of experience. Some of these were described in Waldo Bowman's recent report from England. Others include the use of pierced aluminum plank instead of steel plank to reduce shipping loads, perfection of methods

for the use of coral on Pacific fields, and the development of asphalt impregnated burlap as a surfacing material for emergency fields.

Research has played an important though inconspicuous part in these developments. This is evident in the report elsewhere in this issue on some of the studies conducted by the Engineer Board at Fort Belvoir, Va. Still other developments there and elsewhere cannot be reported at this time.

Pipelines to Battle

BUILT WITHOUT FANFARE, a 1,265-mi. 24-in. pipeline was constructed in the first ten months of 1944 to carry natural gas from Corpus Christi to near Pittsburgh, a construction record outstripping that of the "Big Inch," also a 24-in. line. The "Big Inch" and its companion "Little Inch" continued to operate at capacity carrying oil to the Atlantic Seaboard to relieve the railroads. Their costs, according to the federal operating agency, are such that they will be able to compete with tanker transportation in the postwar period. The 1,700-mi. Controversial "Canol", a 4-in.-dia. pipeline from Norman Wells to Whitehorse, and a refinery transplanted from Texas, were put in operation in the early spring.

But the real pipeline story of the year is that of the facilities laid right into the battle areas of Europe and over the mountains into Burma by Army Engineer petroleum distribution units. A 4-in. line, weighing 13 tons to the mile, and having a capacity of 5,000 bbl. per day, is now laid at rates far in excess of the 20 miles per day achieved in the African campaign. Quickly applied gasket-type couplings are bolted over the joints thus making a line that can be taken up and relaid with complete salvage. Pump stations on the Army pipelines are spaced at about 10-mile intervals and are moved with the line. As petroleum products constitute half of the volume of supplies needed by a modern army the pipelines greatly relieve the demands on other transportation.

Inventory of Sanitation Needs

DEFICIENCIES in urban water supply and sewage disposal facilities create one of the challenging tasks for postwar attention. A quantitative measure of the job ahead is furnished by a U. S. Public Health Service inventory, which estimates that satisfaction of water supply needs will cost $803,300,000 and that expenditures for required sewage disposal facilities will reach $2,255,150,000. The latter figure represents the cost of new sewer systems and extensions and includes a billion-dollar estimate for facilities to treat domestic as well as industrial wastes. Strong justification is presented for such expenditures based on analyses that reveal a yearly economic loss of $50,000,000 resulting from deficiencies in water supply quality, and an anunal loss of $100,000,000 due to stream pollution. It is gratifying to report that excellent progress is being made toward the goals established by the Public Health Service if postwar planning statistics are used as a yardstick. At the close of 1944, *Engineering News-Record* data revealed that proposed water supply construction totaled $575,800,000, of which almost $354,000,000 was in the blueprint stage; proposed sewerage projects totaled $947,455,000, of which nearly $770,700,000 was blueprinted. This excellent showing of advance preparation presages quick action in fulfilling postwar sanitation needs.

Industrial Waste Pollution

NO SUBJECT IN THE SANITARY FIELD has captured more attention than the matter of industrial

Water supply point on a Pacific island. A thermo-compression distillation unit (in background) is used to convert seawater into potable water.

wastes disposal. This reflects in part the difficulties that have been experienced by municipal sewage treatment plants in accommodating their operation to include huge volumes of wastes emanating from new and expanded war production industries. It also anticipates problems of the postwar period when the attention of sanitarians and stream regulatory agencies will be concentrated on the abatement of pollution, the most troublesome of which originates with certain types of industry. However, it becomes increasingly evident that progress in the application of industrial waste abatement measures, which is so intimately associated with specific manufacturing processes and the possibilities of byproduct recovery, must rest on the shoulders of industrial specialists. Recognition of this principle found expression some years ago in the work of the Textile Foundation and most recently by the establishment of the National Council of Stream Improvement of the paper, pulp and paperboard manufacturers. Only as other groups of related industries recognize the desirability of united action, the institution of research programs and the pooling of information will it be possible to accomplish prompt and effective control of industrial pollution.

Clean Stream Legislation

FURTHER IMPETUS to the construction of sanitation facilities would be furnished by the passage of federal anti-pollution legislation. The Congress has been actively concerned about stream pollution since early in 1936, and six years ago both the Senate and the House got together on a bill that was widely favored but which missed passage by a presidential veto on the basis of a technicality in budgetary procedure. Then the war intervened and it was not until last year that pollution control made the headlines. Proposed and generally approved legislation authorized the U. S. Public Health Service and an advisory control board to recommend "clean-up" programs and provided $50 million yearly for grants-in-aid to public and private agencies for the construction of remedial works. Congressional sponsors of this measure are slating it for action in 1945.

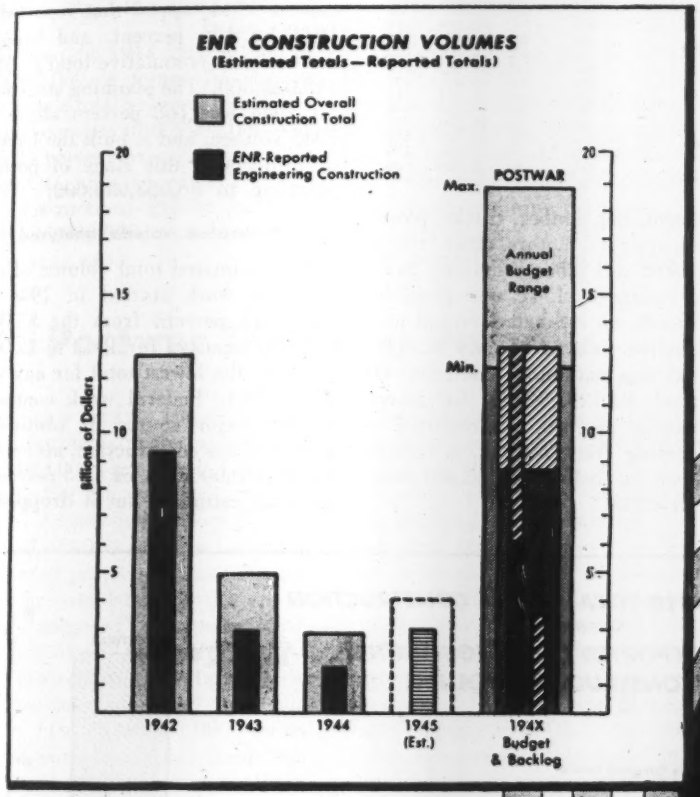
Sanitation South of the Border

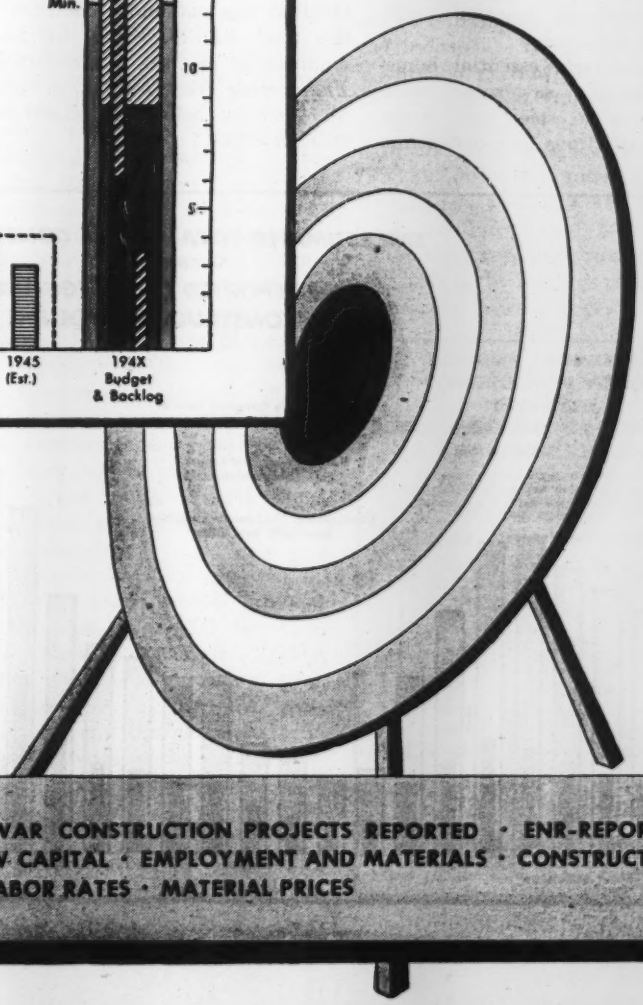
WAR-SPONSORED MEASURES in 1942 led to the inauguration of cooperative health and sanitation programs in 18 Latin American countries under the auspices of the U. S. Coordinator of Inter-American Affairs. Now completing the second year of operation, the plan has been pronounced as a realistic and successful demonstration of the "good neighbor policy" in action. Initially the programs were designed for areas in which our troops and bases were located, or for those places from which strategic materials were obtained; generally a two-year agreement was made under which North American sanitary engineers and doctors were placed in charge of the program in each country and U. S. dollars subsidized the major cost of the work. These agreements have been extended for periods of from two to five years with fourteen Latin American countries, during which our technicians and financial aid are being reduced with the nationals gradually assuming full responsibility for personnel, financing and execution of projects. More than 600 projects are underway or completed, half of which involved mosquito control, water supply and sewerage improvements and the installation of hospital buildings as well as general sanitation facilities; the balance of activity related to medical and nursing services. In addition, some 300 sanitary engineers and physicians have been brought to the United States for special training. Of all our wartime activities in South and Central America, it is a safe conclusion that none has or will produce greater benefits per dollar expended than the work directed toward better health and sanitation.

On the Verge of Transition

SOME DAY, SOON WE HOPE, engineering and construction will start the transition from war to peace along with all other American business and industry. Construction, accounting for one-tenth of our national economy, can be a big factor in postwar America, but not if the construction industry is used as a dumping ground for all labor unemployable elsewhere. It can best serve the interests of the country by being allowed to operate as a free enterprise, employing its own people and creating a demand for employment in production of materials and equipment and in transportation and service industries. In the Seabees and Army Engineer forces are a million men now associated in some way with battlefront construction. Of course, not all will want to continue in construction and engineering, but many will, and we can gainfully use their talents and ability. New materials and equipment will make the big job ahead easier. And construction, the first industry to tackle and complete war contracts, is the industry that is ready and able to help in the transition of the national economy from war to peace.

Construction Today and the Target for *TOMORROW*





ESTIMATED TOTAL VOLUME · POSTWAR CONSTRUCTION PROJECTS REPORTED · ENR-REPORTED TOTAL · RESIDENTIAL BUILDING · NEW CAPITAL · EMPLOYMENT AND MATERIALS · CONSTRUCTION COSTS · LABOR RATES · MATERIAL PRICES

Construction Industry Surveys 1944 And Weighs the Future

CONSTRUCTION'S major tasks were three-fold in 1944—building the overseas bases and facilities to support our military advances; providing essential military and civilian projects at home; and establishing a backlog of planned projects so that construction can be ready to start as soon as war work begins to taper off and we begin our transition from war to peace.

Army and Navy engineers required the production of six times as much construction equipment to handle their 1944 construction as was produced in 1935. Since no dollar volume statistics are available to measure the magnitude of our overseas construction these equipment figures give substance to the reports that come in from all corners of the world on the speed, ingenuity and unprecedented accomplishments of America's military construction men.

The second task, essential home-front construction, saw some easing of restrictions on steel and partial easing of restrictions on construction equipment, but lumber, trucks, power shovels, tractors, motors, other critical equipment and labor remained tight, so no easing of L-41 was possible. As a result, an estimated overall new construction volume of only $2,900,000,000 was put under contract. Of this total, $1,729,753,000 for heavy engineering projects was reported to *Engineering News-Record*, a volume 43.5 percent below the $3,061,844,000 for 1943.

I—ESTIMATED TOTAL CONSTRUCTION

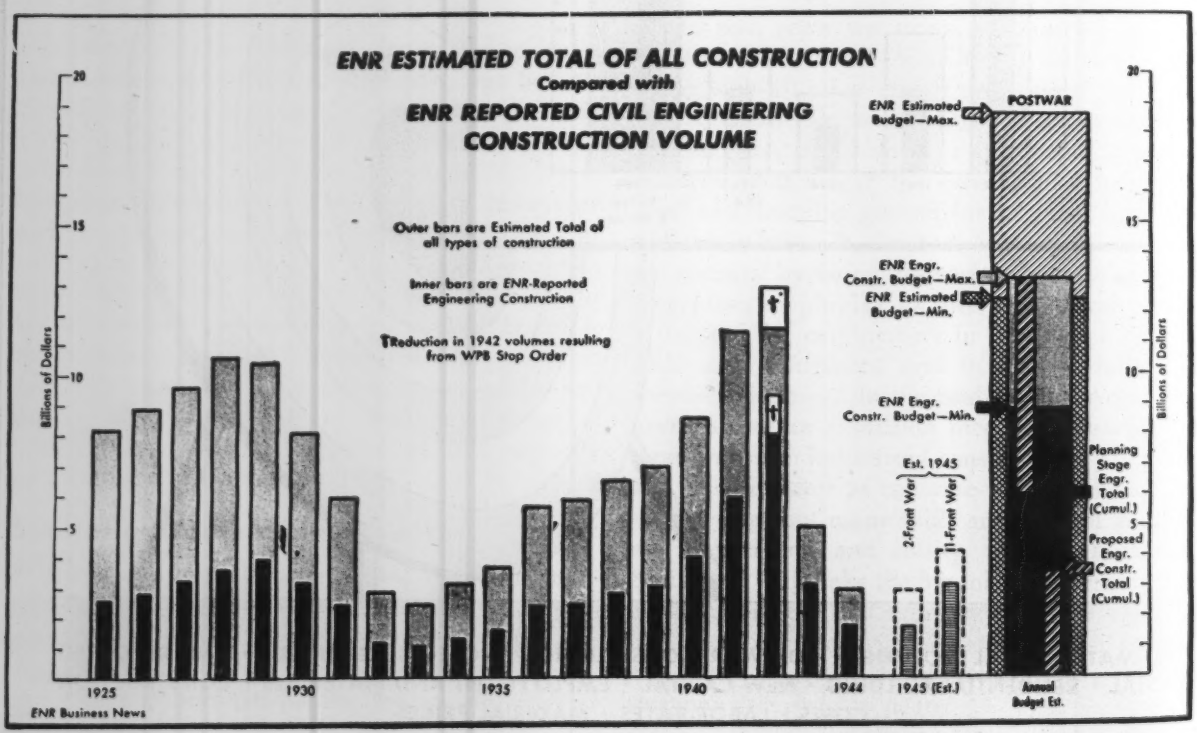
(Millions of Dollars)

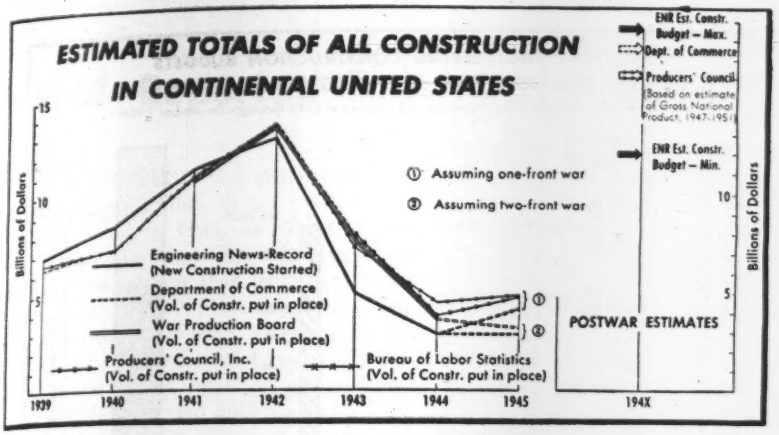
	Public	Private	Total	ENR Vol. Index
1925	2,476	5,702	8,178	201
1926	2,670	6,208	8,878	228
1927	3,073	6,522	9,595	263
1928	3,480	7,100	10,580	287
1929	3,263	7,114	10,377	317
1930	3,363	4,695	8,058	260
1931	3,098	2,832	5,930	220
1932	1,918	921	2,839	127
1933	1,533	907	2,440	102
1934	2,373	731	3,104	114
1935	2,460	1,221	3,680	134
1936	3,140	2,450	5,590	185
1937	2,806	3,046	5,852	172
1938	3,680	2,800	6,480	197
1939	3,750	3,224	6,974	211
1940	4,550	3,960	8,510	269
1941	7,200	4,196	11,396	375
1942	11,061	1,760	12,821	553
1943	3,820	1,180	5,000	176
1944	1,815	1,085	2,900	98

The third major task confronting the industry, continuation and stimulation of the postwar planning begun in 1943, added $11,513,941,000 in proposed new postwar projects, and moved projects totalling $4,406,023,000 into the "plans under way or completed" stage. Proposed project volume in 1944 topped that reported in 1943 by 126 percent, and brought the two-year cumulative total to $16,615,028,000. The planning stage total for 1944 was 168 percent above the 1943 volume, and it built the backlog of projects in this stage of postwar planning to $6,053,983,000.

Estimated volume analyzed

The estimated total volume of construction work started in 1944 declined 42 percent from the $5,000,000,000 reported for 1943 to $2,900,000,000, the lowest total for any year since 1933. Federal work continued as the major source of continental United States construction, accounting for $1,410,000,000, or 48.5 percent of the total estimate, but it dropped 60





percent from the 1943 federal total of $3,520,000,000, a figure 70 percent of that year's total volume. State and municipal construction, $405,000,000, gained 35 percent over last year, but amounted to only 14 percent of the year's construction. Public construction, $1,815,000,000, was 52 percent below a year ago.

The estimate for private construction, $1,085,000,000, was 8 percent below 1943, and the lowest figure reported since 1934. Private engineering construction and individual one- and two-family residential construction, which combine to make up the private total, are 6 and 13 percent lower, respectively, than for 1943.

The volume of new construction that will be started in 1945 obviously depends on the progress of the war. Continuation of a two-front war throughout 1945 would hold new construction started volume down to the 1944 rate, or $2,900,000,000 for the year, as estimated by *Engineering News-Record*. The War Production Board forecasts a volume of $3,250,000,000 in construction completed and put in place during 1945, also assuming that war on both fronts continues throughout this year.

However, if V-E Day comes in the spring of 1945, *Engineering News-Record* estimates that $4,200,000,000 worth of construction can be started during the year, 45 percent more than in 1944. Producers' Council estimates that a volume of $4,800,000,000 worth of construction will be put in place in 1945, and the Bureau of Labor Statistics predicts a $4,910,000,000 total for the year if Germany ceases fighting in the spring.

Postwar Planning Progress

IN THE TWO YEARS since January 1943, identified projects totalling $16,615,028,000 proposed for construction after the war have been reported to *Engineering News-Record*. On $6,053,983,000 of these identified and recorded projects, plans were under way or completed, 36 percent of the total "proposed" reservoir. However, only $458,688,000 worth of these postwar projects were ready for bids, with plans completed and financing available. On $248,331,000 more, plans are completed, but financing, site, or legal problems had not been settled; and for $164,161,000 financing was available, but plans had not been completed.

The volume of proposed projects exceeded the minimum annual construction postwar budget by 91 percent and was 27 percent above the maximum, or a 27 percent start on a second budget year. This "budget" is the volume of heavy engineering construction needed to support a national income of $150,000,000,000 under peace-time conditions. Projects on which plans were underway, had reached 70 percent of a minimum budget year's volume, $8,700,000,000, and 46 percent of a maximum budget year, $13,100,000,000.

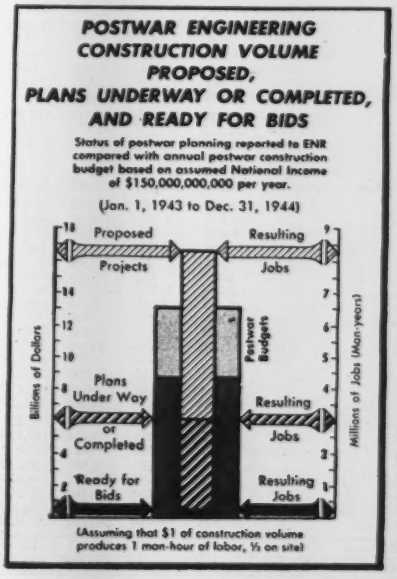
These overall totals from two years of postwar planning effort are impressive. Analysis reveals, however, that the greater portion of the real planning burden has been carried by relatively few states. States with better than average records in both proposed and planning stages are Connecticut, New York, District of Columbia, Michigan, Texas, Montana, Washington, Oregon and California. Four other states, Pennsylvania, Maryland, West Virginia and Ohio, top the U. S. average per capita volume in the plans-under-way-or-completed stage.

Jobs, however, and a healthy civilian economy, will be needed throughout the United States, in areas where planning lags, as well as where plans are well advanced.

The construction now reported in the planning stage would produce 3,027,000 jobs, 1,000,000 for construction workers at the site, 2,000,000 for off-the-site workers producing construction materials, supplies, service and equipment.

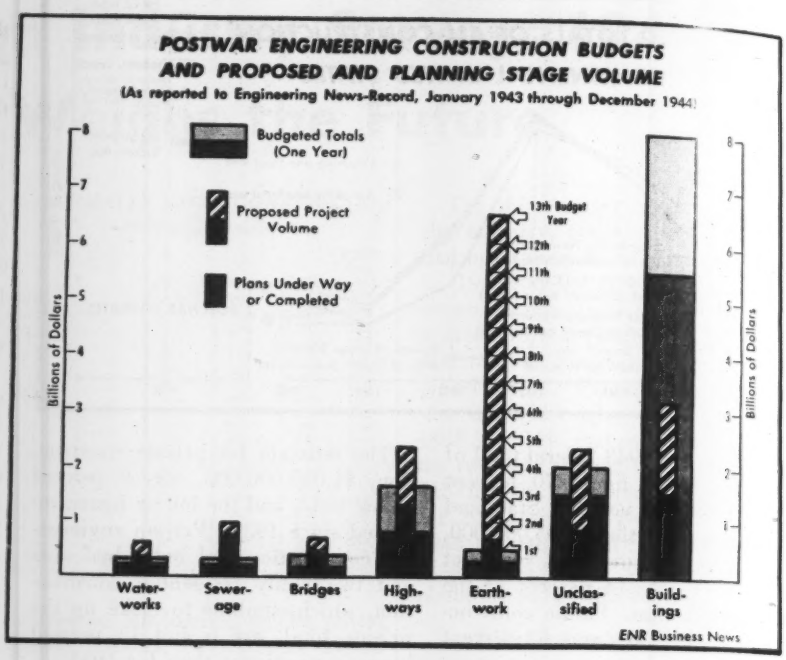
Proposed waterworks exceed the maximum annual budget figure by 92 percent; sewerage is 216 percent over the top of its one-year budget; bridges are 88 percent over; earthwork and drainage, 1,197 percent; highways, 44 percent; and unclassified construction, 18 percent. However, in engineered buildings—public, commercial and industrial—the proposed volume is only 58 percent of the minimum budget of $5,500,000,000, 40 percent of the maximum, $8,000,000,000.

In the planning stage, waterworks, $353,892,000; sewerage, $769,697,000; bridges, $475,814,000; and earthwork and drainage, $685,444,000, all top their respective maximum one-year budgets by margins ranging from 18 percent in waterworks to 156 per-


POSTWAR ENGINEERING CONSTRUCTION VOLUME PROPOSED, PLANS UNDERWAY OR COMPLETED, AND READY FOR BIDS
Status of postwar planning reported to ENR compared with annual postwar construction budget based on assumed National Income of $150,000,000,000 per year.
(Jan. 1, 1943 to Dec. 31, 1944)
Proposed Projects
Resulting Jobs
Billions of Dollars
Postwar Budgets
Millions of Jobs (Man-years)
Plans Under Way or Completed
Resulting Jobs
Ready for Bids
Resulting Jobs
(Assuming that $1 of construction volume produces 1 man-hour of labor, ½ on site)

cent in sewerage. Streets and roads, $1,330,763,000 exceed their minimum budget by 63 percent, but are 18 percent below the maximum. Unclassified construction, $880,909,000, is 59 percent of its minimum and 44 percent of its maximum, and engineered buildings, $1,557,464,000, are 28 and 19 percent of annual minimum and maximum budgets.

By regions, 25.6 percent of the proposed postwar construction is in West of the Mississippi states; 24.0 percent in Middle Atlantic; 23.4 percent in Far West; 15.1 percent in Middle West; 8.0 percent in the South; and 3.9 percent in New England. Distribution of the $6,053,983,000 on which planning is started is: Middle Atlantic, 37.8 percent; Middle West, 20.8 percent; West of Mississippi, 16.7 percent; Far West, 15.6 percent; South, 4.8 percent; and New England, 4.3 percent.



II—TWO-YEAR RECORD PROPOSED AND PLANNING STAGE POSTWAR CONSTRUCTION PROJECT VOLUME

As Reported to Engineering News-Record in 1943 and 1944—Thousands of Dollars

(PROPOSED VOLUMES IN LIGHT-FACE TYPE; PLANNING STAGE VOLUMES IN BOLD-FACE)

	Waterworks and Sewerage		Highways and Bridges		Earthwork and Unclassified		Buildings, All Types		Federal Government Work		Private Construction		Public Construction		Postwar Engr. Constr. Total		$ Per Capita 1940 Census	
e	1,177	175	33,140	32,825	3,278	25	7,285	4,155	978	.....	1,605	1,150	43,275	35,230	44,880	36,380	53.0	42.9
H	320	235	17,980	3,037	8,446	380	14,096	6,768	300	.....	16,044	2,588	24,798	7,832	40,842	10,420	83.1	21.2
	1,550	1,550	350	350	55,815	815	1,625	1,425	55,000	150	750	600	58,590	3,540	59,340	4,140	165.3	11.5
as	57,248	35,585	7,219	2,274	52,523	14,676	64,525	41,385	20,202	.....	22,488	13,195	159,027	80,725	181,515	93,920	42.1	21.7
I	1,938	440	21,560	950	5,163	305	24,252	9,420	259	74	9,243	5,735	43,670	5,380	52,913	11,115	74.3	15.6
nn	10,852	8,311	68,007	65,114	87,848	2,750	95,316	30,600	66,884	15	74,586	20,988	187,437	85,796	262,023	106,784	153.4	62.4
w Eng	73,085	46,296	148,256	103,750	213,073	18,960	207,099	93,753	143,623	239	124,716	44,256	516,797	218,503	641,513	262,759	76.1	31.2
Y	301,588	279,110	468,848	414,375	810,045	224,971	955,936	542,175	73,462	3,976	289,174	224,064	2,247,243	1,236,567	2,536,417	1,460,631	188.1	108.4
J	68,676	11,668	100,431	63,402	29,342	8,958	54,446	31,727	6,450	150	27,638	16,638	225,257	105,117	252,895	115,755	60.8	27.8
	166,642	121,031	228,845	183,416	397,787	186,183	95,093	65,161	198,340	.....	50,900	24,956	837,467	522,835	888,367	547,791	89.8	55.3
d	20,282	17,458	51,950	43,207	25,777	900	69,190	42,196	17,959	5,000	16,980	12,410	150,219	91,281	167,199	103,761	91.9	57.0
C	20,485	16,333	51,246	40,350	59,608	3,106	22,872	3,575	7,865	.....	648	150	153,563	63,208	154,211	63,358	232.6	95.4
d	.....	.....	.....	.....	2,879	.....	.....	.....	215	.....	25	.....	2,854	.....	2,879	.....	10.8	.....
id. Atl.	577,673	445,600	901,320	744,750	1,325,438	418,112	1,197,537	682,834	304,291	9,126	385,365	272,288	3,616,603	2,019,008	4,001,968	2,291,296	132.2	75.6
	9,825	5,119	54,837	26,121	122,827	551	30,586	24,120	115,805	.....	5,708	2,100	212,367	53,811	218,075	55,911	81.5	20.8
Va	8,050	8,050	270	270	22,550	3,000	160	160	19,500	.....	50	.....	30,980	11,480	31,030	11,480	16.3	6.0
C	5,164	2,173	5,700	500	206,492	1,433	22,143	13,800	200,158	.....	19,328	12,631	220,171	5,275	239,499	17,906	67.1	5.0
C	2,463	2,463	4,982	4,982	103,418	1,201	2,350	900	99,010	.....	3,814	.....	109,399	9,546	113,213	9,546	59.6	5.0
	1,289	1,264	3,067	467	47,810	1,390	19,630	16,330	31,931	.....	23,586	12,932	48,210	6,519	71,796	19,451	23.0	6.2
a	29,150	28,638	21,298	17,224	92,701	23,768	20,250	16,717	42,790	.....	12,500	6,400	150,899	79,947	163,399	86,347	86.2	45.5
a	1,035	1,035	2,505	2,505	82,498	1,777	23,719	17,771	64,037	.....	6,335	2,577	103,422	20,511	109,757	23,088	38.8	8.2
ss	840	840	263	250	17,410	1,185	600	400	10,225	.....	7,285	1,235	11,828	1,440	19,113	2,675	8.7	1.2
	8,017	4,967	3,632	.....	128,404	6,554	20,528	5,185	117,457	.....	14,102	5,344	146,479	11,362	160,581	16,706	67.9	7.1
	245	175	1,058	1,058	4,235	2,418	690	250	.....	.....	4,425	2,568	1,803	1,333	6,228	3,901	2.2	1.4
nn	19,091	19,091	11,660	11,625	77,112	1,495	80,585	8,185	67,200	.....	15,054	2,395	173,397	38,001	188,451	40,396	64.8	13.9
uth	85,169	73,815	109,272	65,002	905,457	44,772	221,244	103,818	768,113	.....	112,187	48,182	1,208,955	239,225	1,321,142	287,407	46.9	10.2
io	116,115	106,982	231,599	176,479	163,460	132,636	219,717	146,344	20,066	.....	89,538	62,023	641,353	500,418	730,891	562,441	105.8	81.4
d	31,249	30,112	90,838	49,673	65,831	29,152	47,442	25,445	13,127	.....	19,996	11,968	215,364	122,414	235,360	134,382	68.6	39.2
	53,646	45,978	42,656	28,912	223,728	16,137	59,592	30,911	138,579	.....	25,060	14,715	354,562	107,223	379,622	121,938	48.1	15.5
is	18,633	17,750	20,033	17,657	15,194	12,242	31,331	24,824	329	.....	12,979	7,296	72,212	65,177	85,191	72,473	27.2	23.1
ich	168,497	125,549	200,416	69,148	268,559	56,652	437,739	116,215	8,789	3,500	13,124	9,809	1,062,087	357,755	1,075,211	367,564	204.5	69.9
id. West	388,140	326,371	585,542	341,869	736,772	246,819	795,821	343,739	180,890	3,500	160,697	105,811	2,345,578	1,152,987	2,506,275	1,258,798	94.2	47.2
inn	5,059	4,037	26,542	14,916	59,894	32,393	59,463	29,081	2,493	.....	25,625	16,919	125,333	63,508	150,958	80,427	54.1	28.8
wa	9,281	9,075	13,361	12,876	36,376	6,451	5,663	2,753	21,292	.....	5,765	1,718	58,916	29,437	64,681	31,155	25.5	12.3
o	37,374	9,643	298,039	27,132	238,802	26,571	149,919	23,263	179,671	.....	100,787	25,890	623,347	60,719	724,134	86,609	191.3	22.9
k	810	550	23,495	25	44,716	2,698	9,359	4,000	6,321	.....	9,050	6,598	69,330	675	78,380	7,273	40.2	3.7
D	623	558	30	30	230,901	2,710	700	550	227,746	.....	1,105	1,105	231,149	2,743	232,254	3,848	362.0	6.0
D	2,976	1,811	855	255	275,875	618	995	120	274,853	.....	992	592	279,709	2,212	280,701	2,804	437.0	4.4
ib	6,494	6,244	20,575	20,575	200,548	3,215	3,845	2,815	186,880	.....	1,959	1,537	229,503	31,312	231,462	32,849	175.8	25.0
an	5,313	5,215	2,253	2,139	185,962	2,984	3,976	3,176	162,435	.....	24,012	2,379	173,492	11,135	197,504	13,514	109.7	7.5
da	6,656	6,030	1,350	950	83,706	29,214	23,032	14,446	36,034	.....	37,061	15,908	77,683	34,732	114,744	50,640	49.2	21.7
ex	82,985	65,129	240,185	141,247	534,243	276,508	270,526	128,208	392,316	175,213	167,332	80,555	960,607	530,537	1,127,939	611,092	175.8	95.3
ont	2,338	2,205	73,245	55,000	311,260	534	430	40	310,726	.....	549	374	386,724	57,405	387,273	57,779	693.0	103.4
yo	245	.....	2,480	2,480	231,134	921	1,400	150	230,213	.....	1,171	921	234,088	2,630	235,259	3,551	937.0	14.1
ko	13,187	13,187	12,530	12,530	348,078	1,529	8,384	1,800	334,406	.....	2,869	2,779	379,310	26,267	382,179	29,046	340.0	25.9
M	230	.....	174	100	50,725	.....	3,259	775	48,378	.....	2,167	.....	52,221	875	54,388	875	102.1	1.6
. of Miss.	173,571	123,684	715,114	290,255	2,832,220	386,346	540,951	211,177	2,413,764	175,213	380,444	157,275	3,881,412	854,187	4,261,856	1,011,462	160.0	37.9
abo	610	610	600	600	181,226	494	3,365	450	171,744	.....	694	694	185,107	1,460	185,801	2,154	354.0	4.1
ah	9,120	8,115	42,394	9,694	146,324	561	3,385	1,022	144,704	.....	275	100	200,948	19,292	201,223	19,392	365.5	35.3
ig	30	30	6,931	6,931	618,997	.....	.....	.....	601,140	5,445	5,333	.....	620,625	6,961	625,958	6,961	1,254.0	14.0
ev	.....	.....	31,827	9,221	20,215	.....	1,185	900	17,657	831	575	550	52,652	9,571	53,227	10,121	484.0	93.0
ash	41,692	28,425	133,983	102,027	579,532	2,264	44,777	12,609	572,791	.....	14,841	8,566	785,143	128,750	799,984	137,325	461.0	79.3
re	17,627	16,785	18,450	18,150	250,809	39,937	22,442	4,973	245,254	35,382	4,926	2,415	304,402	77,430	309,328	79,845	283.6	73.3
alif	156,538	61,858	356,299	114,328	1,034,517	408,068	159,399	102,189	784,272	351,306	146,896	26,240	1,559,857	660,223	1,706,753	686,463	247.2	99.4
r West	225,617	107,823	590,484	260,951	2,831,620	451,344	234,553	122,143	2,537,562	392,964	173,540	38,565	3,708,734	903,696	3,882,274	942,261	340.0	82.5
S. Total	1,523,255	1,123,589	3,049,988	1,806,577	8,844,580	1,566,353	3,197,205	1,557,464	6,348,243	581,042	1,336,949	666,377	15,278,079	5,387,606	16,615,028	6,053,983	126.2	46.1
nada	242,563	54,908	1,344,396	522,039	944,082	241,601	326,122	89,999	.....	.....	103,380	39,282	2,753,783	869,265	2,857,163	908,547	250.0	79.5

ENR—Reported Construction Lower

CIVIL ENGINEERING construction in continental United States totaled $1,729,753,000 in 1944, as reported by *Engineering News-Record*. This is 43.5 percent lower than in the preceding year, and the lowest volume reported to *ENR* since 1935. Continued restrictions on non-essential construction, material and labor shortages, and a greatly decreased military building program within the U. S. were responsible for the 1944 decline.

Federal work was still the major factor in the year's volume, accounting for $1,118,613,000, or 65 percent of the engineering construction total. This federal total, however, was 53 percent below the $2,373,987,000 reported in 1943 when it made up 77.4 percent of the volume.

State and municipal construction reached $247,516,000 for the year, topping 1943 by 26 percent. This increase, however, could not offset the federal decline, and as a result, the public engineering construction total, $1,366,129,000, was 47 percent lower than a year ago, and the lowest since 1937. Public work accounted for 79 percent of the 1944 total, and the balance, 21 percent was private.

Private construction, $363,624,000, was down 26 percent compared with 1943, and dropped below all other annual totals reported since 1934.

Private industrial buildings with a 4 percent increase over 1943, and earthwork and drainage with a 35 percent gain over its all-time low of a year ago, were the only two classes of work to report increased volumes in 1944.

The private industrial building volume, $174,314,000, was only a partial measure of the manufacturing facilities constructed in 1944. Federally-owned, federally-operated industrial-type buildings added $69,853,000 during the year; and federally-owned, privately-operated plants added $140,883,000, to bring the federal and private plant construction total to $385,050,000, a total that compares with $420,097,000 for all industrial building construction in 1943, and the peak volume of $2,578,230,000 in 1942.

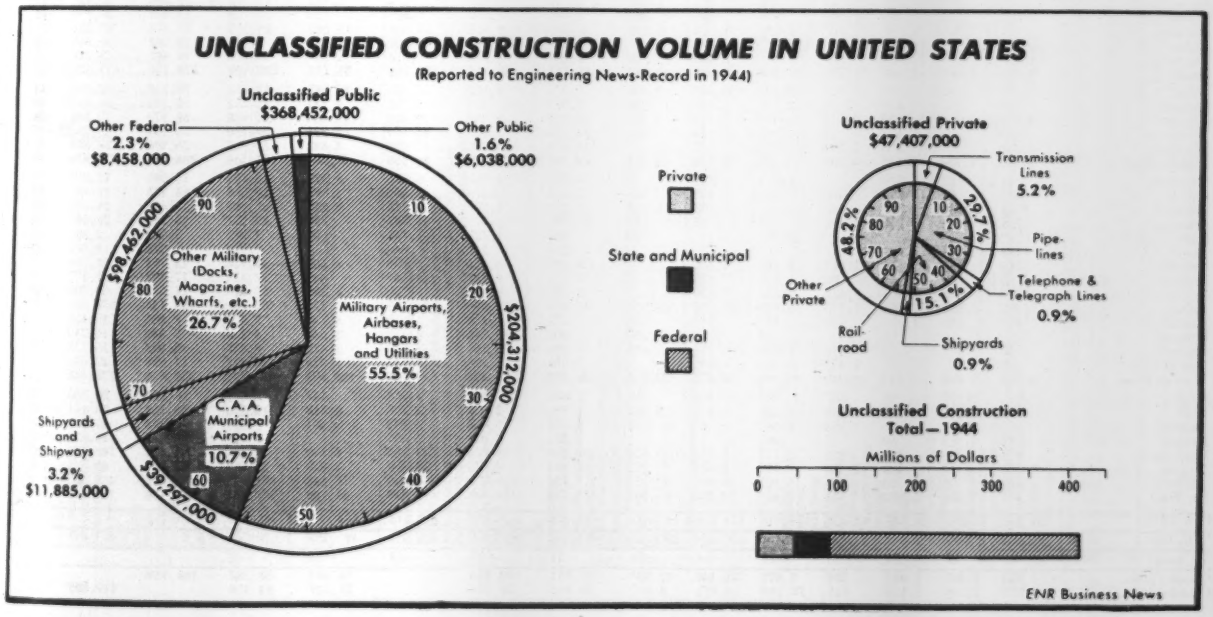
Commercial building and large-scale private housing volume in 1944, $140,418,000, declined 39 percent from last year. Of this 1944 total, $131,788,000 was for private mass housing, and $8,630,000 for other private commercial buildings.

Mass housing reported by *ENR* includes the $131,788,000 in private projects, $47,467,000 in federal military housing, and $78,574,000 in war workers' housing, an overall total of $257,829,000. Last year mass-housing construction volume was $706,134,000—private, $228,684,000; military, $37,352,000; and war workers' housing, $440,098,000.

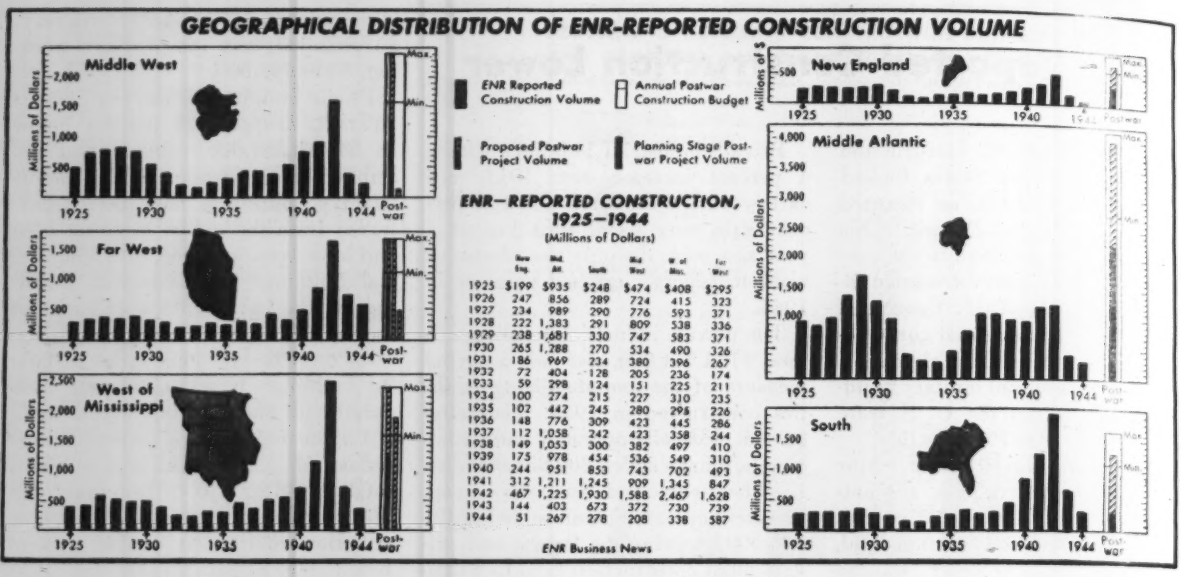
Public building for the year, $657,539,000, dropped 54 percent below its $1,419,357,000 volume in 1943. Publicly-financed housing and industrial-type buildings have been transferred from the public building total and have been included with commercial buildings and industrial buildings in the paragraphs above and in the charts on the succeeding page. The 1944 total for all other types of public buildings is $320,762,000, compared with $688,644,000 a year ago.

Engineered building construction—industrial, commercial and public—totaled $972,271,000 for the year, 56.2 percent of the engineering construction volume. It was 46 percent below the $1,816,737,000 for 1943 when it accounted for 59 percent of the *ENR*-reported total.

The unclassified construction total, $415,859,000, was made up of $368,452,000 in public work, and $47,407,000 in private. It declined 51 percent from the 1943 volume, and was below the annual totals from 1940 through 1943, but topped all previously reported volumes. Of the unclassified public total, 55.5 percent was for military aviation construction—$88,634,000 for airports and airbases; $83,459,000 for hangars and buildings, and $32,219,000 for utilities and facilities. In addition to this military airfield construction, there was $39,297,000 in CAA- and municipally-financed



GEOGRAPHICAL DISTRIBUTION OF ENR-REPORTED CONSTRUCTION VOLUME



ENR—REPORTED CONSTRUCTION, 1925—1944

(Millions of Dollars)

	New Eng.	Mid. Atl.	South	Mid West	W. of Miss.	Far West
1925	$199	$935	$248	$474	$408	$295
1926	247	856	289	724	415	323
1927	234	989	290	776	593	371
1928	222	1,383	291	809	538	336
1929	238	1,681	330	747	583	371
1930	265	1,288	270	534	490	326
1931	186	969	234	380	396	267
1932	72	404	128	205	236	174
1933	59	298	124	151	225	211
1934	100	274	215	227	310	235
1935	102	442	245	280	298	226
1936	148	776	309	423	445	286
1937	112	1,058	242	423	358	244
1938	149	1,053	300	382	497	410
1939	175	978	454	536	549	310
1940	244	951	853	743	702	493
1941	312	1,211	1,245	909	1,345	847
1942	467	1,225	1,930	1,588	2,467	1,628
1943	144	403	673	372	730	739
1944	51	267	278	208	338	587

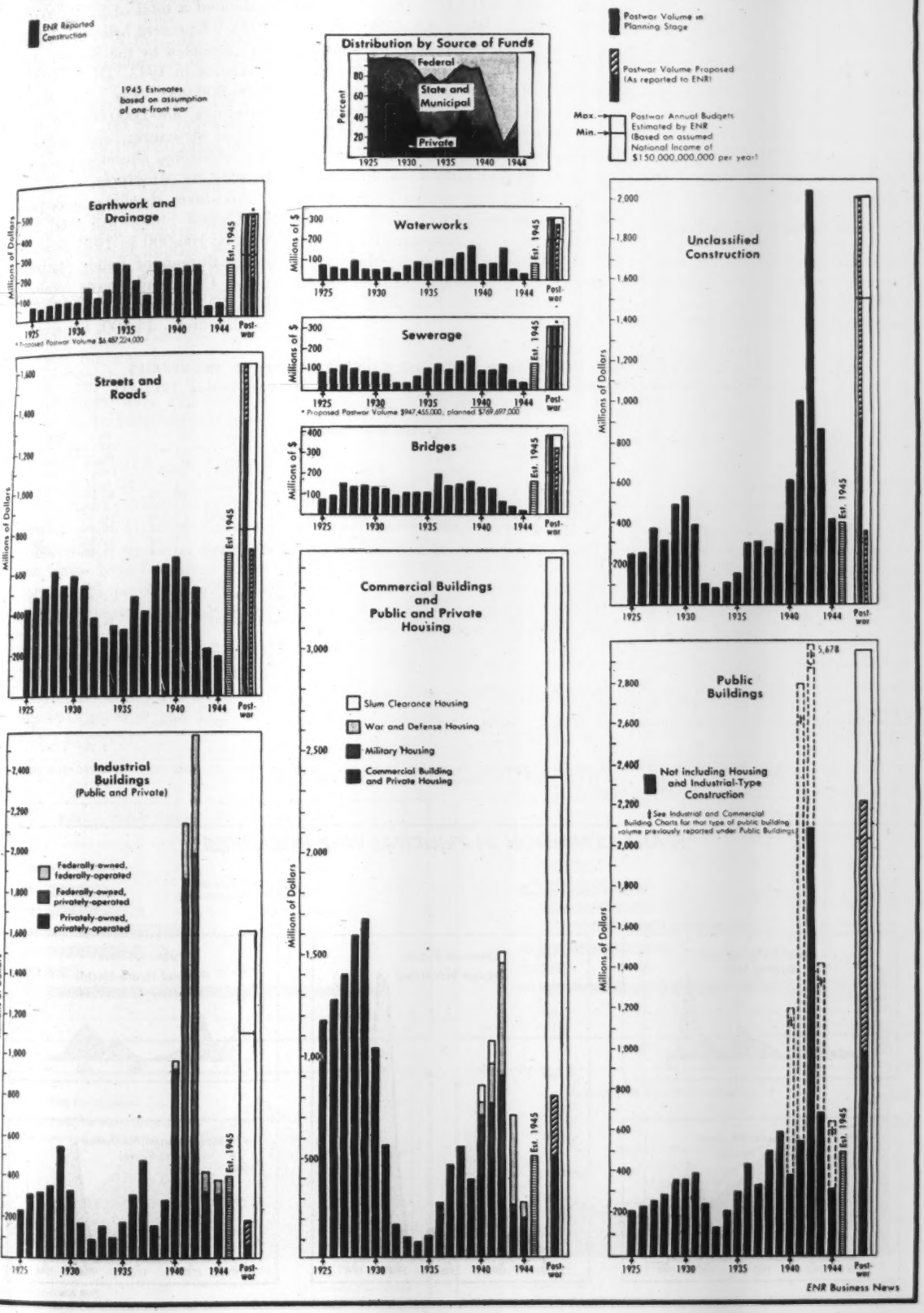
ENR Business News

III—ENGINEERING CONSTRUCTION REPORTED IN 1944 BY ENGINEERING NEWS-RECORD

Minimum contracts reported: Waterworks, excavation, drainage and irrigation, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.
(Thousands of Dollars—000 omitted)

States	Water-works	Sewer-age	Bridges	Earth-work	Streets and Roads	BUILDINGS: Indus-trial	BUILDINGS: Commer-cial	BUILDINGS: Public	Un-classified	Federal Gov't. Work	All Construction: Private	All Construction: Public	1944 Total 52 Weeks	1943 Total 52 Weeks	% Change 1943 to 1944
Maine	302	177	17	58	192	485	150	1,864	1,796	4,053	700	4,341	5,041	29,937	−83
New Hampshire	56	.....	185	28	150	553	325	850	117	995	893	1,371	2,264	3,428	−34
Vermont	.....	.....	26	.....	.....	50	600	44	129	114	668	181	849	1,662	−49
Massachusetts	148	128	39	271	1,793	4,359	479	5,717	6,513	10,842	5,079	14,368	19,447	47,263	−59
Rhode Island	325	22	25	297	390	425	150	3,496	3,435	7,525	774	7,791	8,565	13,690	−37
Connecticut	419	1,115	86	297	685	3,559	2,279	5,311	1,340	7,488	6,195	8,896	15,091	48,164	−69
New England	**1,250**	**1,442**	**378**	**951**	**3,210**	**9,431**	**3,983**	**17,282**	**13,330**	**31,017**	**14,309**	**36,948**	**51,257**	**144,144**	**−64**
New York	114	997	99	769	2,318	495	.....	17,931	12,033	26,446	495	34,261	34,756	88,307	−61
New Jersey	1,051	827	487	827	3,488	7,4+8	8,983	9,797	30,272	43,367	17,110	46,070	63,180	111,685	−43
Pennsylvania	933	912	361	404	11,527	22,409	10,760	32,239	12,370	39,128	38,773	53,142	91,915	85,062	+ 8
Maryland	656	1,901	320	333	2,825	1,610	4,200	25,341	15,718	43,073	5,870	48,034	53,904	92,565	−42
District of Columbia	182	284	32	.....	1,577	.....	1,750	12,563	2,405	15,269	1,775	17,018	18,793	13,569	+38
Delaware	76	.....	.....	.....	331	45	.....	624	3,356	4,169	45	4,387	4,432	11,868	−63
Middle Atlantic	**3,012**	**4,921**	**1,299**	**2,333**	**23,066**	**32,007**	**25,693**	**98,495**	**76,154**	**171,452**	**64,068**	**202,912**	**266,980**	**403,056**	**−34**
Virginia	1,680	2,629	635	120	10,675	590	2,684	26,938	14,607	46,821	3,339	57,219	60,558	90,004	−33
West Virginia	53	.....	555	.....	2,748	150	.....	5,185	7,447	10,767	2,043	14,095	16,138	22,636	−29
North Carolina	937	392	.....	.....	2,318	1,300	389	6,310	8,086	15,507	1,742	17,990	19,732	54,972	−64
South Carolina	139	988	.....	345	563	530	.....	4,727	4,419	10,746	530	11,181	11,711	38,079	−69
Georgia	1,705	1,035	517	.....	3,790	1,663	200	6,795	5,208	14,020	1,933	18,980	20,913	62,982	−67
Florida	2,202	1,020	778	668	5,843	7,040	.....	10,399	22,144	35,891	7,040	43,054	50,094	180,643	−72
Alabama	993	839	848	.....	3,509	871	1,405	8,149	3,850	12,691	2,402	17,562	19,964	52,827	−62
Mississippi	198	176	55	2,368	953	480	250	5,458	1,535	9,575	755	10,718	11,473	30,890	−63
Louisiana	334	693	1,140	7,142	4,529	3,126	3,010	8,739	9,065	19,354	11,065	26,713	37,778	47,631	−21
Kentucky	.....	.....	42	847	5,777	1,200	.....	1,295	941	2,537	1,910	8,192	10,102	20,563	−51
Tennessee	1,372	310	299	794	5,301	2,480	2,800	2,738	3,813	7,314	5,562	14,105	19,667	72,0[illegible]	−73
South	**9,613**	**7,582**	**4,869**	**12,284**	**46,006**	**19,430**	**10,798**	**86,733**	**80,815**	**185,243**	**38,321**	**239,809**	**278,130**	**673,316**	**−59**
Ohio	1,342	1,102	1,286	210	15,958	10,555	5,805	9,376	9,582	17,123	17,983	37,233	55,216	142,612	−61
Indiana	527	368	519	22	13,722	8,100	875	7,591	671	7,733	9,183	23,212	32,395	81,214	−60
Illinois	3,178	1,406	330	2,815	14,424	7,814	7,036	13,822	6,145	20,458	15,284	41,686	56,970	70,846	−20
Wisconsin	668	445	144	55	2,467	4,624	800	24,278	1,620	25,800	5,971	29,130	35,101	18,934	+85
Michigan	580	1,577	406	1,084	4,828	4,443	.....	15,374	306	17,036	4,643	23,955	28,598	58,324	−51
Middle West	**6,295**	**4,898**	**2,685**	**4,186**	**51,399**	**35,536**	**14,516**	**70,441**	**18,324**	**88,150**	**53,064**	**155,216**	**208,280**	**371,930**	**−44**
Minnesota	14	37	369	.....	4,770	2,414	.....	5,761	1,715	6,881	2,477	12,603	15,080	19,876	−24
Iowa	260	62	253	174	3,446	1,488	151	3,110	3,579	5,060	1,997	10,526	12,523	18,856	−34
Missouri	104	524	809	497	2,056	2,723	5,415	5,226	4,277	9,745	8,763	12,868	21,631	28,587	−24
Arkansas	173	85	105	2,441	826	55	150	30,757	1,175	34,337	230	35,537	35,767	29,557	+21
North Dakota	.....	.....	.....	.....	2,141	.....	250	108	1,323	1,131	550	3,272	3,822	2,598	+47
South Dakota	184	28	.....	21	.....	.....	.....	276	211	648	.....	720	720	8,601	−92
Nebraska	318	161	33	3,642	5,430	4,500	.....	4,437	5,235	10,073	4,500	19,256	23,756	81,194	−71
Kansas	55	303	57	95	2,560	175	.....	7,433	7,187	14,552	441	17,424	17,865	61,277	−71
Oklahoma	359	215	1,543	1,437	3,275	5,625	.....	2,983	6,250	7,780	9,205	12,482	21,687	60,595	−64
Texas	6,494	3,589	555	4,483	16,617	33,268	15,744	41,433	27,950	66,702	62,174	87,959	150,133	353,586	−58
Montana	253	158	.....	126	221	917	650	371	5,170	3,310	4,238	3,628	7,866	10,116	−22
Wyoming	.....	.....	16	.....	768	.....	250	809	4,045	3,456	1,648	4,240	5,888	10,730	−45
Colorado	90	438	12	114	1,009	1,191	835	3,209	3,185	5,839	3,425	6,658	10,083	15,175	−34
New Mexico	13	.....	21	3,439	1,841	1,000	.....	2,959	1,826	8,111	1,025	10,074	11,099	29,694	−63
West of Miss.	**8,317**	**5,600**	**3,773**	**16,469**	**44,960**	**53,356**	**23,445**	**108,872**	**73,128**	**177,625**	**100,673**	**237,247**	**337,920**	**730,442**	**−54**
Idaho	.....	100	60	357	851	196	150	7,887	695	8,938	447	9,849	10,296	20,750	−50
Utah	257	715	167	1,559	1,256	835	5,852	7,181	2,332	12,293	6,818	13,336	20,154	30,184	−33
Arizona	326	.....	.....	1,252	1,581	50	152	1,332	6,025	8,245	1,861	8,857	10,718	25,337	−58
Nevada	52	13	80	96	561	.....	.....	2,651	3,025	5,837	.....	6,478	6,478	16,578	−61
Washington	921	660	503	803	4,117	1,767	2,836	23,919	18,576	41,855	4,846	49,256	54,102	146,737	−63
Oregon	57	45	402	2,220	3,700	2,015	823	14,014	3,685	21,058	3,069	23,892	26,961	44,335	−39
California	3,204	6,003	2,350	21,548	15,009	19,691	52,170	218,732	119,770	366,900	76,148	382,329	458,477	455,035	+ 1
Far West	**4,817**	**7,536**	**3,562**	**27,835**	**27,075**	**24,554**	**61,983**	**275,716**	**154,108**	**465,126**	**93,189**	**493,997**	**587,186**	**738,956**	**−20**
U. S. 1944	**33,304**	**31,979**	**16,566**	**64,058**	**195,716**	**174,314**	**140,418**	**657,539**	**415,859**	**1,118,613**	**363,624**	**1,366,129**	**1,729,753**	.....	.....
U. S. 1943	46,055	40,783	25,800	47,380	227,186	166,834	230,546	1,419,357	857,903	2,373,987	491,298	2,570,546	.....	3,061,844	.....
% Change '43 to '44	−28	−22	−36	+35	−14	+4	−39	−54	−51	−53	−26	−47	.....	.....	−43½
Canada, 1944	1,855	1,001	1,547	394	7,875	35,446	10,804	27,211	23,626	.....	51,492	58,267	109,759	.....	.....
Canada, 1943	2,310	3,106	1,115	813	20,756	18,472	4,987	28,716	38,730	.....	25,629	93,376	.....	119,005	− 8

ENR-REPORTED CONSTRUCTION VOLUME—BY CLASS OF WORK



airports, bringing the total airfield construction to $243,609,000, 66.2 percent of the unclassified public total.

Waterworks construction, $33,304,000, decreased 28 percent from the preceding year and was the lowest annual total on record. Sewerage, $31,979,000, declined 22 percent to its lowest volume since 1933. Highways and bridges, both at all-time lows, were down 14 and 36 percent from their respective 1943 totals.

Geographical distribution

Geographically, all six sections of the country reported lower volumes in 1944 than in the preceding year. New England volume, $51,257,000 is 64 percent below a year ago; Middle Atlantic, $266,980,000, is down 34 percent; South, $278,130,000, off 59 percent; Middle West, $208,280,000, 44 percent; West of the Mississippi, $337,920,000, 54 percent; and Far West, $587,186,000, 20 percent.

In 1944, 34 percent of the engineering construction was in the Far West states, the second successive year this region led the nation in volume of new construction started. The West of Mississippi share of the year's total was 19.5 percent; South accounted for 16.1 percent; Middle Atlantic, 15.4 percent; Middle West, 12.0 percent; and New England, 3.0 percent.

Preliminary estimates of building permit volume in 257 identical cities indicated a total of $730,000,000 for 1944, 11 percent below the $819,112,000 reported by the Bureau of Labor Statistics in 1943. Of the 1944 total, $205,000,000 was for residential buildings, $300,000,000 for non-residential structures, and $225,000,000 for additions, alterations and repairs to existing structures.

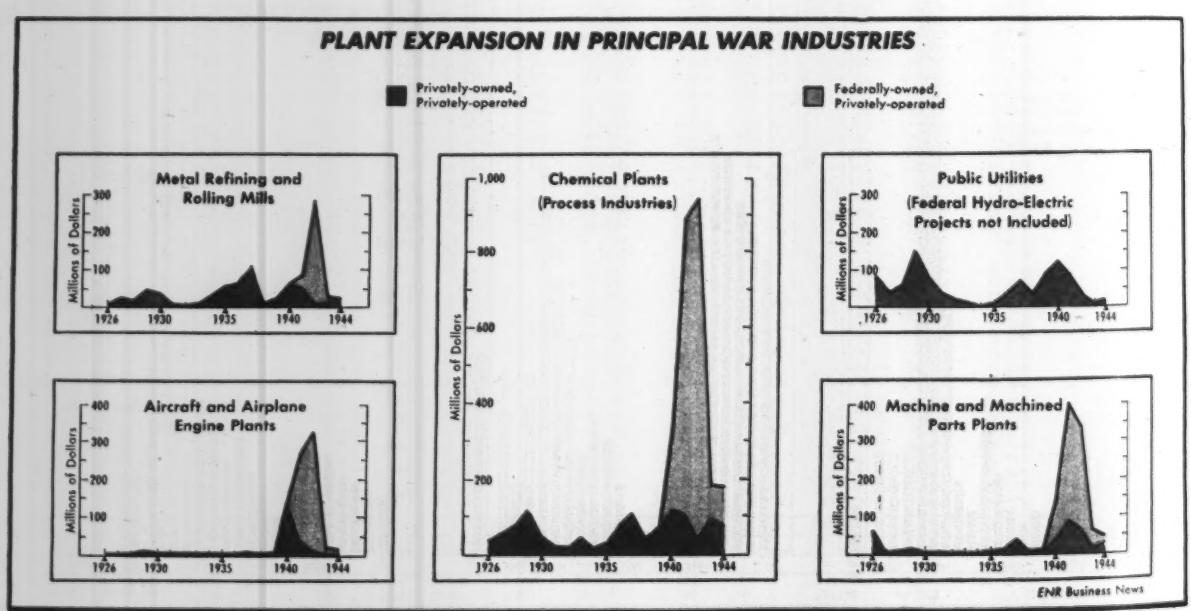
Non-farm dwelling units provided in United States will total approximately 166,000 in 1944 according to early Bureau of Labor Statistics figures. One-family units totaled 141,000, 85 percent of the volume; two-family units, 14,000, 8 percent; and

IV—CONTRACTS FOR INDUSTRIAL BUILDING CONSTRUCTION BY INDUSTRIES
(Federally-owned privately-operated plants added to private construction 1941-44)

(Value in Thousands of Dollars, ENR Reports)

	1941			1942			1943			1944		
	Pvt. Own.	Fed. Own.	Total	Pvt. Own.	Fed. Own.	Total	Pvt. Own.	Fed. Own.	Total	Pvt. Own.	Fed. Own.	Total
Transportation Service												
1. Railroads	$2,965	.....	$2,965	$2,473	.....	$2,473	$3,180	.....	$3,180	$5,488	.....	$5,488
2. Automotive	9,202	.....	9,202	1,733	.....	1,733	1,029	.....	1,029	2,225	.....	2,225
Public Utilities	86,180	.....	86,180	29,225	.....	29,225	6,555	$300	6,855	14,769	.....	14,769
Process Industries (a)	115,539	$777,034	892,573	42,263	$902,206	944,469	104,024	82,201	186,225	75,376	108,453	183,829
Food Industries (b)	34,263	.....	34,263	9,544	500	10,044	9,134	.....	9,134	11,080	1,229	12,309
Metal Refining and Rolling	52,636	39,171	91,807	9,217	272,325	281,542	13,875	11,409	25,284	17,439	3,617	21,056
Metal Working Plants												
1. Auto Factories	2,980	.....	2,980	530	.....	530	210	200	410	540	.....	540
2. Aircraft Factories	40,977	235,796	276,773	16,687	314,688	331,375	1,406	20,045	21,451	4,052	8,162	12,214
3. Foundries	2,235	.....	2,235	6,629	22,991	29,620	1,368	3,360	4,728	2,861	2,680	5,541
4 Mach. and Mach. Parts	92,210	310,347	402,557	62,338	272,349	334,687	16,631	42,312	58,943	27,820	16,652	44,472
Radio	1,755	1,325	3,080	2,300	1,000	3,300	498	40	538	167	.....	167
Textiles (Excluding rayon)	9,148	.....	9,148	366	.....	366	320	.....	320	823	.....	823
Wood Industries	2,672	.....	2,672	700	.....	700	1,049	.....	1,049	517	.....	517
Miscellaneous												
1. General Factories	42,634	.....	42,634	15,729	123	15,852	6,825	255	7,080	9,039	90	9,129
2. Refrigeration and Cold Storage	780	.....	780	585	.....	585	730	.....	730	2,118	.....	2,118
Total	$496,176	$1,363,673	$1,859,849	$200,319	$1,786,182	$1,986,501	$166,834	$160,122	$326,956	$174,314	$140,883	$315,197

(a) Includes distilleries. (b) Includes breweries and wineries.



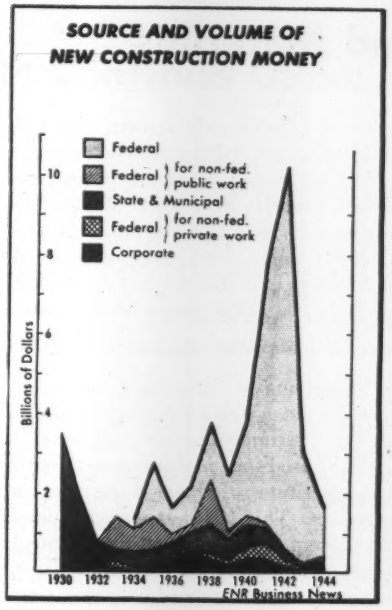
multi-family units, 11,000, or 7 percent. Of the total units provided, 138,000 were privately-financed, and the balance, 28,000, were publicly-financed. Value of the total number of units approximated $535,000,000 according to BLS.

Looking forward to 1945, BLS estimated that 160,000 new units would be provided, with 136,000 units in the one-family class; 10,000 in the two-family group; and 14,000 units in multi-family structures.

FHA mortgages selected for appraisal, or mortgage applications received, were valued at $667,800,000 in 1944, a total 26 percent lower than in the preceding year according to early figures. Approximately $315,800,000 was for war housing (Title VI), and $352,000,000 was for repairs, alterations and additions to existing homes, and for non-war home building (Title II).

Residential building costs climbed 2.2 percent in the first ten months of 1944 as reported by the Federal Home Loan Bank Board. This index of residential building costs for a standard six-room frame house revealed material costs up 2.8 percent during the year, and labor costs 1 percent higher in the ten-month period.

The average for the first ten months, 132.5, was 4.2 percent above that for 1943. Materials climbed 5.3 percent above the 1943 average, and labor was higher by 2.4 percent.



New capital for construction purposes for the year totaled $1,713,491,000, a volume 44 percent below the $3,073,080,000 reported by *ENR* for the preceding year. Federal appropriations for military and departmental construction were 74 percent of the 1944 new financing total, private investment was 18 percent, and federal funds for non-federal work were 8 percent.

The new construction financing total for 1944 was made up of $112,919,000 in corporate security issues, $192,282,000 in state and municipal bond sales, $61,940,000 in RFC loans (public and private), $20,000,000 in REA loans, $63,000,000 in Federal-Aid highways, and $1,263,800,000 in federal appropriations for military and departmental construction.

V—NEW CONSTRUCTION CAPITAL

(Millions of Dollars)

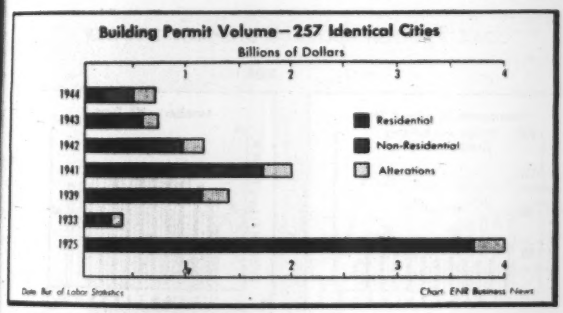
	Corporate	State and Municipal	Federal	Total
1925	$1,966	$1,352	.....	$3,318
1926	1,824	1,344	.....	3,168
1927	1,784	1,475	.....	3,259
1928	1,568	1,379	.....	2,947
1929	1,758	1,418	.....	3,176
1930	2,032	1,434	.....	3,466
1931	787	1,235	.....	2,022
1932	159	561	.....	720
1933	292	1,091‡	.....	1,383
1934	77†	1,011‡	194	1,282
1935	47†	1,337‡	1,354	2,738
1936	251	698‡	691	1,640
1937	518†	738‡	946	2,202
1938	457†	1,902‡	1,345	3,704
1939	304†	783‡	1,318	2,405
1940	624†	805‡	2,466	3,895
1941	741†	477‡	6,677	7,895
1942	382†	225‡	9,662	10,219
1943	56†	135‡	2,882	3,073
1944	194†	193‡	1,327	1,714

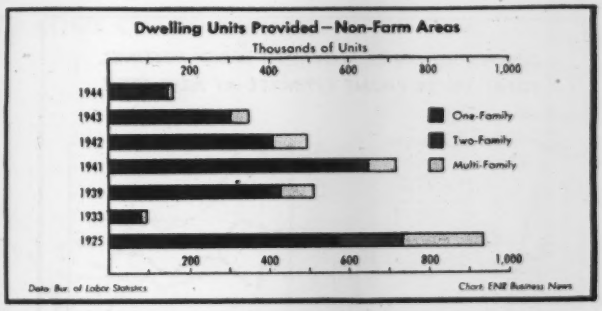
Note:—Federal appropriations include federal-aid highway, WPA, and regular departmental appropriations for construction.

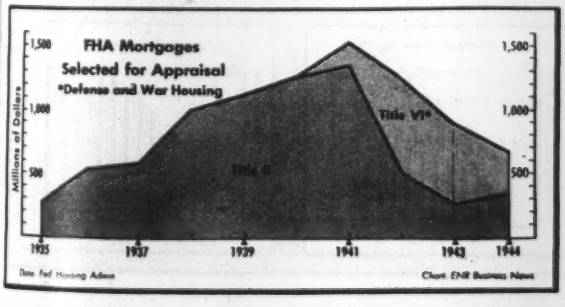
† Includes $237,000,000 RFC and PWA loans '33; $55,000,000, '34; $9,000,000, '35; $807,000, '37; $76,106,000 REA, $4,500,000 RFC loans, '38; $89,000,000 REA and $400,000 RFC loans, '39; $40,000,000 REA and $193,000,000 in RFC loans 40; $100,500,000 in REA and $282,000,000 in RFC loans in '41; $149,800,000 in RFC in '42; $20,000,000 in REA and $14,030,000 in RFC in '43; $20,000,000 in REA and $61,440,000 in RFC loans in '44.

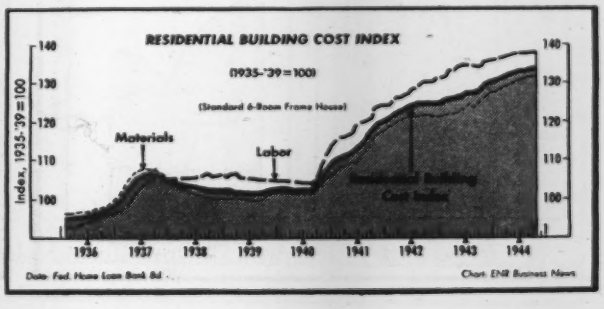
‡ Includes $814,000,000 RFC and PWA loans and grants, '33; $580,000,000, 34; $808,000,000, '35; $164,700,000, '36; $207,000,000, '37; $723,265,000 PWA, $99,844,000 RFC, $320,986,000 USHA loans, '38; $216,000,000 in USHA loans, '39; $219,000,000 USHA, $5,000,000 RFC loans in '40; $30,000,000 in USHA, $6,900,000 in RFC loans in '41; $7,655,000 in RFC loans in '42; $3,133,000 in FPHA and $1,015,000 RFC loans in '43; $500,000 in RFC loans in '44.

RESIDENTIAL BUILDING STATISTICS









Employment and Materials

CONSTRUCTION EMPLOYMENT estimates averaged 1,329,000 workers per month in the first ten months of 1944, a decrease of 25 percent from the 1,764,000 men reported as the average for 1943 by the National Industrial Conference Board. The estimates include only contract construction employment at the project site, and are exclusive of force account workers, and workers engaged in offsite prefabrication.

The August estimate of 1,453,000 men was the highest recorded in 1944. The year opened with 1,254,000 construction men employed, and with exception of a decrease in February, climbed steadily to reach the year's high in August. September employment receded to 1,432,000 men, and in October, the latest available figure, it declined further to 1,344,000 men.

Federal and state highway construction averaged 24,092 workers per month during the first ten months of 1944, and was 46.5 percent below the average monthly employment reported in 1943 by FWA-PRA, 45,042 men.

Overall employment estimates rose from a monthly average of 62,026,000 workers in 1943 to an average of 63,142,000 during the ten-month 1944 period a gain of 1.5 percent according to N.I.C.B. employment statistics.

Material shipments

Shipments of fabricated structural steel for bridge and building construction are estimated at 598,000 tons in 1944, based on preliminary American Institute of Steel Construction statistics. This 1944 estimate dropped 28 percent from the 1943 figure. Steel ingot production, on the other hand, reported its fifth record-breaking year in a row in reaching 89,552,961 net tons in 1944. It eclipsed the former high of 1943 by 1 percent according to the American Iron and Steel Institute.

Portland cement shipments for the year are expected to total 94,234,000 barrels, a 26 percent decrease from the preceding year, and the lowest annual volume since 1935. The Portland cement industry operated at 35 percent of its capacity in 1944, a rate that compares with 54 percent in 1943 and 74 percent in 1942 according to U. S. Bureau of Mines reports.

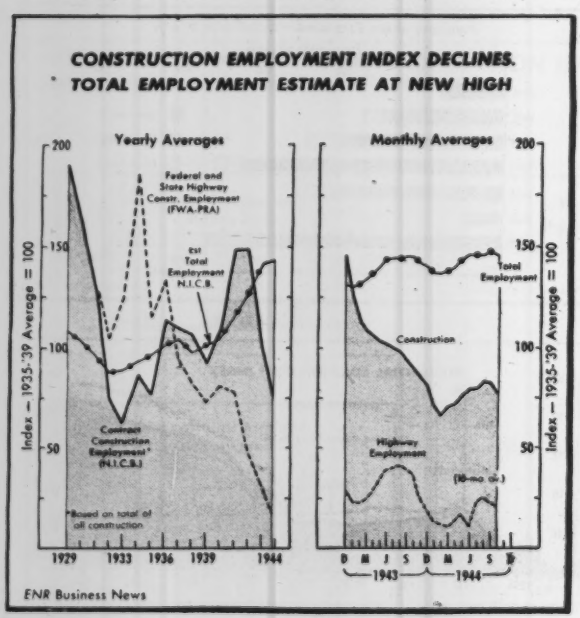
It is estimated that shipments of all types of lumber will total 30,550 million board feet in 1944, a volume 10 percent below the 33,784 million board feet reported last year by the National Lumber Manufacturers Association. This estimated volume, though below 1941, 1942 and 1943 shipment totals, is above that reported in all years between 1929 and 1941. Moveover, an unprecedented percentage was required for boxing and crating for military shipments, and lumber was available to construction only for the most essential work.

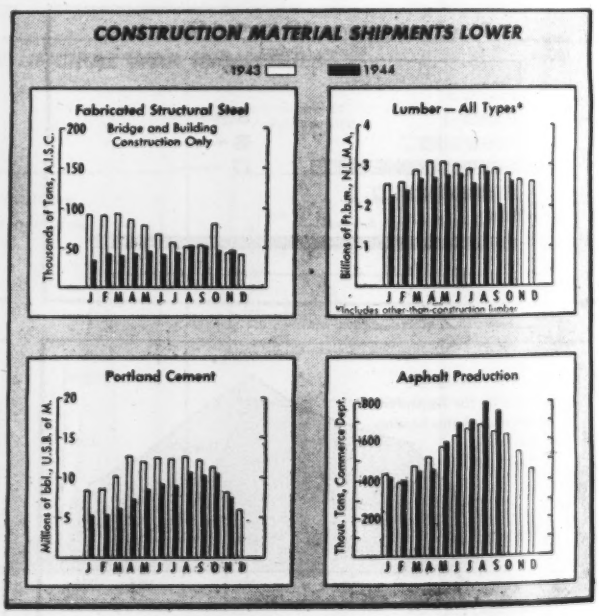
Asphalt production is expected to total 6,684,000 short tons in 1944 according to estimates based on ten-month Department of Commerce figures. The 1944 volume is estimated at 1 percent less than in the preceding year, but it exceeds all other recorded totals.

VI—OUTPUT OF VARIOUS CONSTRUCTION MATERIALS FOR TEN-YEAR PERIOD

Item	Basis	Unit	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	% Change '43 to '44
Lumber	Shipments	Millions Bd. Ft.	19,628	24,283	24,988	22,201	25,811	30,095	34,086	38,946	33,784	30,550*	−10
Cement	Shipments	Thous. Bbl.	75,239	112,850	113,805	106,324	122,651	130,350	167,508	185,267†	127,567†	94,234*†	−26
Cement	Production	% Capacity	29.3	44.1	45.5	41.2	47.7†	51.2†	65.3†	74.0†	54.0†	35.0†	−35
Steel Ingots	Production	Thous. Net Tons.	37,428	52,425	55,443	31,071	51,585	66,982	82,837	86,030	88,836	89,553	+1
Steel Ingots	Production	% Capacity	48.7	68.4	72.4	39.7	64.7	82.1	97.3	96.8	98.1	95.4	−3
Fabricated Structural Steel	Shipments	Thous. Tons	1,095	1,548	1,661	1,159	1,440	1,516	2,251	2,040	‡	‡	
Fabr. Str. Steel—Bridge & Bldg.	Shipments	Thous. Tons	.....	.....	.....	.....	.....	.....	.....	1,678	832	598*	−28
Explosives	Shipments	Thous. lb.	297,730	378,361	387,805	320,259	372,470	406,671	460,075	427,744	451,773	447,100*	−1
Asphalt	Production	Thous. Short Tons	3,115	3,869	4,182	4,341	4,954	5,347	6,558	6,296	6,758	6,684*	−1

* Preliminary estimated totals. † Includes Puerto Rico. ‡ A.I.S.C. estimated shipment data for entire industry discontinued.




CONSTRUCTION MATERIAL SHIPMENTS LOWER
1943
1944
Fabricated Structural Steel
Bridge and Building Construction Only
Thousands of Tons, A.I.S.C.
Lumber — All Types*
Billions of Ft.b.m., N.L.M.A.
*Includes other than construction lumber
Portland Cement
Millions of bbl., U.S.B. of M.
Asphalt Production
Thous. Tons, Commerce Dept.
J F M A M J J A S O N D

Construction Costs Continue Climb

THE RISE in construction costs continued in 1944, exceeding the former all-time high average of 1943 by 3.0 percent as measured by the *ENR* Construction Cost Index. This index of material and labor costs opened 1944 at 294.57 and recorded an increase in every one of the twelve months, finally winding up at 302.30 in December 1944, a climb of 2.6 percent over the opening 1944 month's value.

Lumber and common labor components again were responsible for the increased costs, since cement and structural steel prices were unchanged from 1943. Lumber climbed almost steadily in 1944, although a decrease in the 20-cities' average was recorded in September, and the October average price was unchanged from September. As a result, the lumber price average rose 6.3 percent from January through December 1944.

Common labor rose 2.4 percent during the year, recording increases in seven of the twelve months.

The *ENR* Building Cost Index also set a new high mark in 1944, averaging 234.73 for the year, a gain of 2.5 percent over the previous high of 1943. The Building Cost Index, began 1944 at 231.55 and rose gradually to 236.51 in December, a rise of 2.1 percent in the period. Materials components in this index are the same as in the Construction Cost Index, but the labor component is based on the *ENR* skilled labor wage average which increased 1.3 percent from January to December.

Building costs measured by other general building cost indexes also reported increases in 1944. The American Appraisal Co. Index was up 4 percent compared with its 1943 average; Associated General Contractors Index rose 3 percent; and the E. H. Boeckh Co. Index for brick and concrete factory construction in New York City climbed 8 percent.

Contractors' cost indexes which include management and labor efficiency cost factors in addition to labor rates and materials prices, reported mixed trends in 1944. The Austin Co. Index for 1944, 223, rose 4 percent above the 1943 average; and the Aberthaw Co. Index, 227, rose 1 percent. Both indicated continuation of the rising cost trend in their latest figures. The George A. Fuller Co. Index average, 240 for 1944, was 1 percent higher than last year, but the December value, 236, was 1.7 percent below the preceding months' figure. The 1944

VII—CONSTRUCTION AND BUILDING COST INDEXES
(1913 = 100)

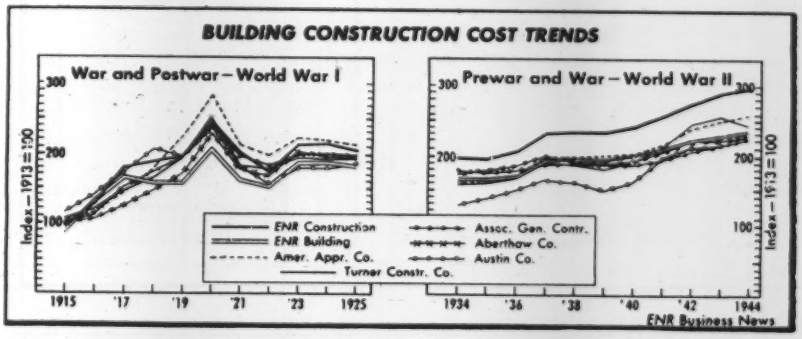
GENERAL INDEXES

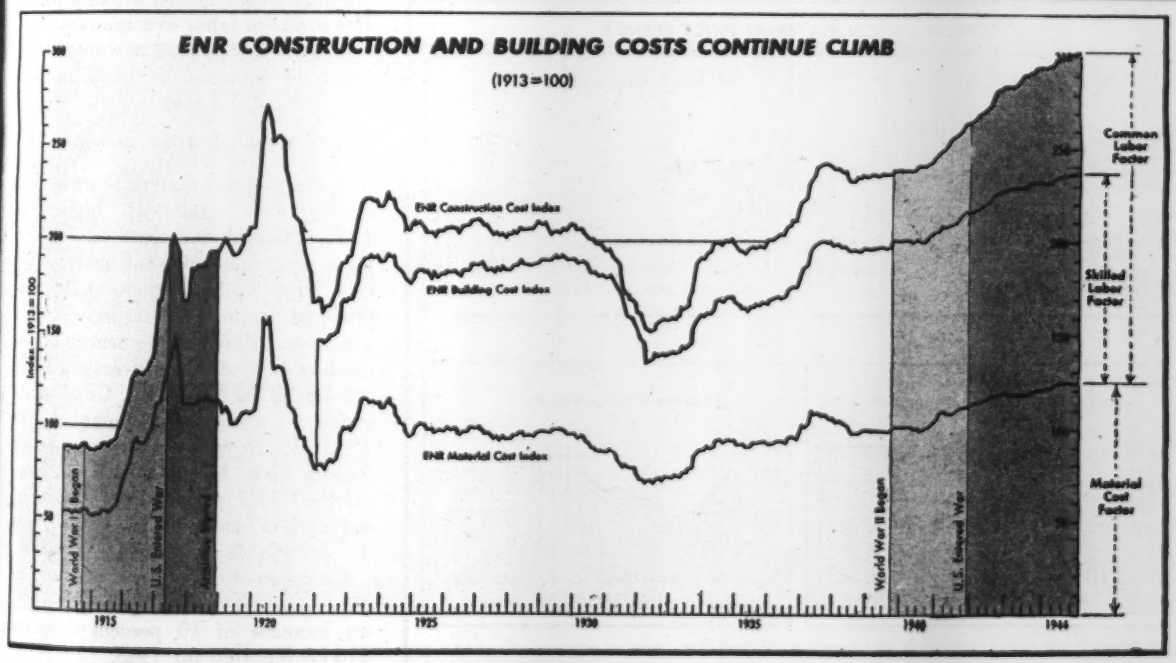
	1929 Aver.	1943 Aver.	1944 Aver.	Dec. 1944
ENR Construction	207	290	299	302
ENR Building	191	229	235	237
Assoc. Gen. Contractors (Bldg.)	203	216	223*	225‡
American Appraisal Co. (Bldg.)	217	251	261	266
E. H. Boeckh (Brick and Concrete Bldg., New York)	242	264	284	292

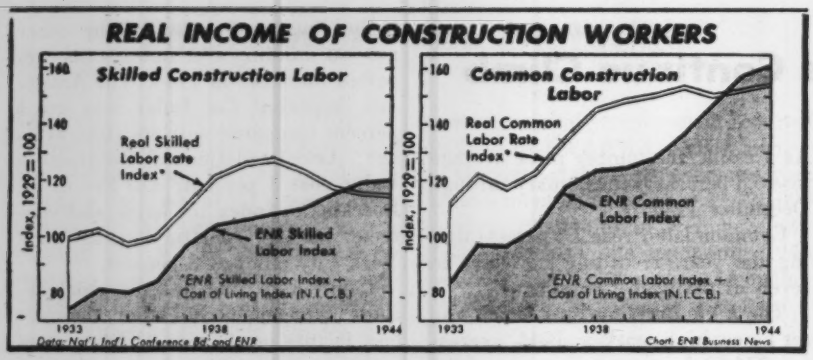
CONTRACTORS' INDEXES

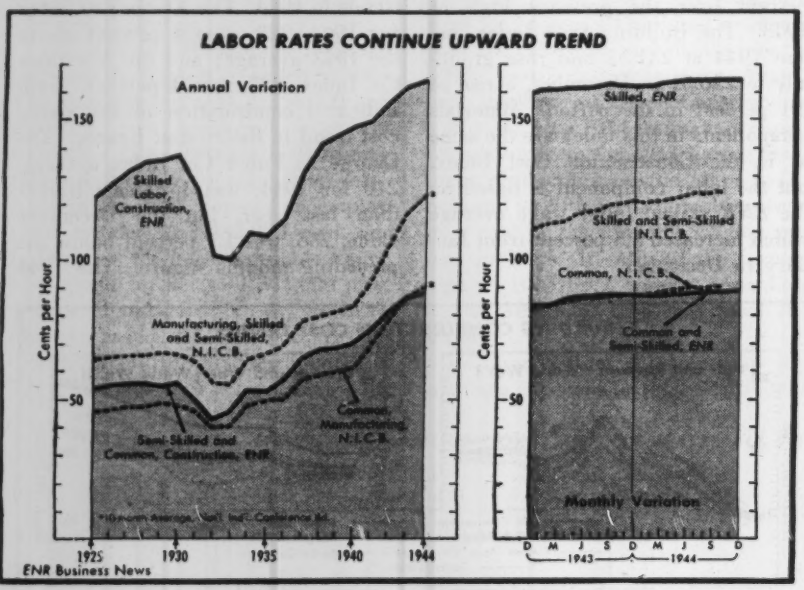
Aberthaw Co. (Bldg.)†	190	225	227	231
Turner Constr. Co. (Bldg.)	185	257	244	244
Austin Company (Bldg.)	170	215	223	226
Geo. A. Fuller Co. (Bldg.)	201	238	240	236

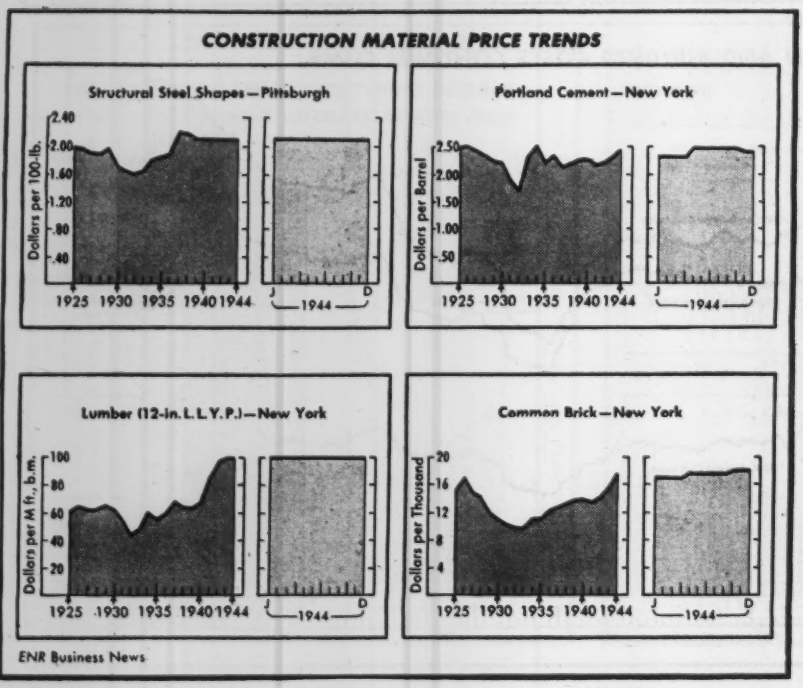
†1914=100. *Eleven-month average. ‡November, 1944.






REAL INCOME OF CONSTRUCTION WORKERS
Skilled Construction Labor
Index, 1929=100
Real Skilled Labor Rate Index*
ENR Skilled Labor Index
*ENR Skilled Labor Index ÷ Cost of Living Index (N.I.C.B.)
Common Construction Labor
Real Common Labor Rate Index*
ENR Common Labor Index
*ENR Common Labor Index ÷ Cost of Living Index (N.I.C.B.)
1933
1938
1944
Data: Nat'l. Ind'l. Conference Bd. and ENR
Chart: ENR Business News





Turner Construction Co. Index average, 244, was 5 percent lower than in 1943 due to drastically reduced use of overtime.

Common labor hourly rates for construction workers averaged 87.9c. in 1944, a record high, and 2.5 percent over the 1943 *ENR* 20-cities' average hourly rate. The common average rate opened the year at 85.9c., and by December had reached 89.6c.

The skilled construction hourly rate average for the 20-cities was $1.620 in January 1944 and reached $1.641 in December, an average rate of $1.634 for the year. The December value was 1.3 percent higher than at the opening of the year, and the 1944 average topped the previous all-time high of 1943 by 1.2 percent.

The rates for common and skilled labor in 26 manufacturing industries rose at a faster pace during 1944 than those reported for construction labor. The average hourly rate for manufacturing common labor increased 4 percent over the preceding year, and skilled labor was 5 percent higher according to ten-month statistics reported by N.I.C.B.

The real income of skilled construction workers, that is the hourly rates adjusted for increased living costs, remained practically unchanged from 1943 levels. Although the skilled construction workers' average hourly rate increased 1.2 percent over 1943, living costs rose 1.1 percent, neutralizing most of the skilled workers' gains. The common labor average rate, however, rose 2.5 percent and more than offset the increase in the living cost reported by N.I.C.B.

Material Price Trends

Construction material price averages were generally higher in 1944, although long-leaf yellow pine timbers, structural steel shapes, and cast iron pipe prices were unchanged from their respective 1943 averages. Portland cement, not including cost of sacks, averaged $2.42 per barrel in New York City, an increase of 6.6 percent compared with 1943. The 20-cities' average price for 2x4-in. pine, $52.21 per M ft., b.m., climbed 13.7 percent over last year, and 2x4-in. Douglas fir, $54.21, was 4.6 percent above the 1943 average.

Common brick price average in New York was $17.46 per M in 1944, an increase of 10 percent over the $15.88 reported for 1943.

How Army Engineers are

Weaving the Sinews of War

Harold W. Richardson
Western Editor, Engineering News-Record

***Editor's Note**—The American public marvels at the array of ingenious engineer equipment used by our armies throughout the world. These devices, playing such an important part in modern warfare, are mostly the result of painstaking design, investigation and testing work by the Engineer Board—the little publicized research and development agency of the Corps of Engineers located at Ft. Belvoir, Va. In addition to all equipment required by the army engineers, the Board develops many products for other military branches. The organization and functions of the Engineer Board are discussed and some of its more important developments described.*

THEY DIDN'T JUST HAPPEN—those army bridges used in the advance across Belgium, the detonating apparatus that cleared the mines from Anzio Beach, the tankdozers that swept away the dragons teeth and hedgerows in Normandy, the landing mats that made the Aleutian campaign possible, the portable water filtration and distillation plants so essential in the South Pacific, and the battlefield pipe lines that carry gasoline to the very front lines. These and hundreds of other items of army engineer equipment came from ideas and developments of the Engineer Board, the little-known but highly important and successful laboratory division of the Corps of Engineers with its headquarters at Fort Belvoir, Va. The Board is charged with the conception, development, perfection and testing of all Army Engineer items of equipment, including things for other branches for which the Corps of Engineers is responsible. Its hand-picked staff of officers, enlisted men and civilian technicians literally weave the sinews of war into a workable military fabric.

Though heretofore unpublicized and therefore practically unknown, the Engineer Board does not work alone. Almost every branch of the army and navy assigns liaison officers to the Board who consult with and help the Board staff in development of items suited to their various branches. Then, too, much help comes from American industry, and research facilities of other federal agencies and from many commercial laboratories.

The Engineer Board does not normally manufacture or procure equipment for the army. Its sole functions are development and testing and the

Signal Corps photo

Fig. 1. Treadway bridge of pin-connected channels carries a tank destroyer across the Moselle River in France.

Fig. 2. Fire power, protection and more push are added to the bulldozer by mounting the blade on a Sherman M4 tank, the first "tankdozer".

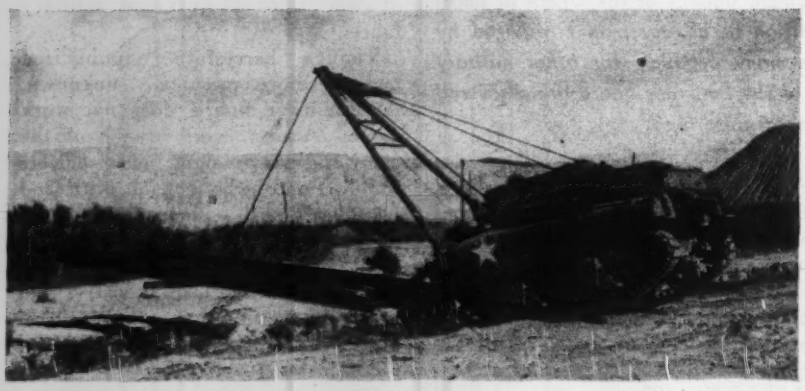


Fig. 3. For canal crossings, two lengths of pin connected treadways are dropped across the gap by a tank-mounted crane.

building of a full-scale pilot model of each and every item. Many of the pilot models are built in the Board's splendidly equipped and manned shops, but some of the larger items, such as bridges and heavy equipment, are produced by outside industry under contract.

Likewise, much of the design and engineering work is done by the Board staff, but in many instances designs are prepared by outside consulting firms or by engineering forces of manufacturers.

Anticipating the needs

The items and projects to be considered and developed originate in numerous ways. First, of course, the army general staff in planning the overall military strategy and the various campaigns indicates the equipment that will be required. The various military subdivisions of the Army —Ground, Air, and Service Forces each suggest more detailed requirements, to be developed or tested. Much of the equipment, however, is originated by the Board staff in anticipation of requirements.

War is not static, and many indeed are the requests that come in from the field for special equipment to meet certain situations, or for changes in standard items found to be unsatisfactory under some operating conditions. Such requests from the battlefronts always mean a rush job, for the success of a drive or the lives of many men may be at stake.

The Board sends representatives to all war theaters to observe and report on the performance of equipment. Representatives of the Board also examine captured equipment and samples are returned for test and determination of methods for neutralizing its effectiveness or utilizing it for our use.

When a request comes in for a new item, or an idea for one develops, the first step is to see what is available along that line in the open market. Perhaps the exact item is not available, but some standard piece of equipment might readily be adapted to serve the purpose. If so, it is recommended for procurement instead of ignoring such possibilities and taking the time to develop something similar but brand new.

How the Board operates

The permanent station of the Engineer Board is Fort Belvoir, Va., where for years it was housed in old wooden barracks at the post, and struggled along with a pitiful average pre-war appropriation of some $72,000 a year and with little equipment. Now it is comfortably located in a group of new, well equipped and substantial office, laboratory and shop buildings completed in June 1942 on a large tract adjoining the main post. Its present budget is in excess of $10,000,000, an indication of the scope and importance of the work being done.

The Board consists of seven members, headed now by Brig. Gen. John W. N. Schulz, president, and Col. W. J. Matteson, executive officer, and five other officers of the Corps of Engineers. Operations are divided into four technical divisions and a service division. Each division is organized into numerous branches, all related, and the branches are split up into sections for detail operations. Directors of the technical divisions are all members of the Board. The technical staff includes many officers and enlisted men from the Corps of engineers, and civilian engineers and technicians. The work of the Board is considered so important that requests to other branches for men with specific talents are seldom refused.

The Board maintains several installations aside from Headquarters. Elsewhere at Ft. Belvoir is a test track, admittedly the world's worst road for testing rolling equipment. On the Atlantic seaboard is a testing station for amphibious craft and for underwater obstruction clearing apparatus, conducted jointly with the navy. Near by on the seacoast is a laboratory for testing seawater distillation units. Land mine detonators and detectors and demobilition explosives are given field tests at an isolated spot in Virginia.

Near Imperial Dam on the Colorado River is the floating bridge test-

ing station. This site was selected as ideal for the purpose because of a sluiceway below the dam. Water in the sluiceway can be regulated to various velocities from slack water to 8 ft. per sec. by manipulating the sluiceway gates. Some fixed bridges are also tested at this station, as are also floating equipment and inundated ground transportation units.

Prior to the African invasion the desert west of Imperial Dam was the testing ground for desert equipment. This is past history, and the project has been abandoned except for deep well pump tests.

Fig. 4. Laboratory at Fort Belvoir for development and testing of water filtration equipment. Sumps and pumps are deep below floor level at the far end.

Division operations

Technical Division I, under the direction of Lt. Col. Giles L. Evans, includes the motion picture, aerial photography, and mapping branches and also the unrelated demolitions branch. The motion picture branch is concerned chiefly with production of films of equipment under test for study and of views of equipment at work, for technical purposes. Liaison with the Army Forces concerning the installation of aerial camera equipment is the main mission of the aerial photographic branch.

The mapping branch has supervision of surveying instruments, photogrammetry and map reproduction. Captured Jap and German surveying instruments have been closely examined and tested. The photogrammetry lab has developed new methods in preparing maps from aerial photographs, and the map reproduction unit is busy improving portable printing plants for use in the field.

General demolition tests for destruction of all kinds of structures are under constant study. An important function of the demolition branch is the clearing of land mines, admittedly one of the most exasperating of all problems facing the Board.

Lt. Col. J. A. Hamilton heads Technical Division II, handling radiation materials, electrical engineering, camouflage and applied electronics branches. This is the main laboratory division of the Board, for it has the electrical, chemical, physical, electronics and materials laboratories, divided into 24 sections. While the division is directly responsible for many projects, it also does work for the other divisions, for it is literally a buzzing core with lines of activity shooting out in all directions.

A sealed tropical room has been set up, where materials and instruments are tested under high temperatures and humidity. Stacked on shelves in this steaming room are leathers, textiles, rubbers, fabrics of all kinds, metals and delicate instruments being attacked by 25 different tropical fungi under the watchful eyes of the technicians. Studies of soil cultures of fungi yield information on the growth, spread and control of these tropical nuisances.

A few feet away is the temperature lab, a huge steel vacuum bottle large enough to swallow a 6x6 truck. Here everything from fur mittens to trucks and tractors can be tested in temperatures down to 70 deg. below zero, in a 15-mile wind whipped up by a big fan and under atmospheric pressures simulating those at 35,000 ft. in the air. Engines steeped in bitter cold for hours are tested for starting ability, instruments of all kinds are checked

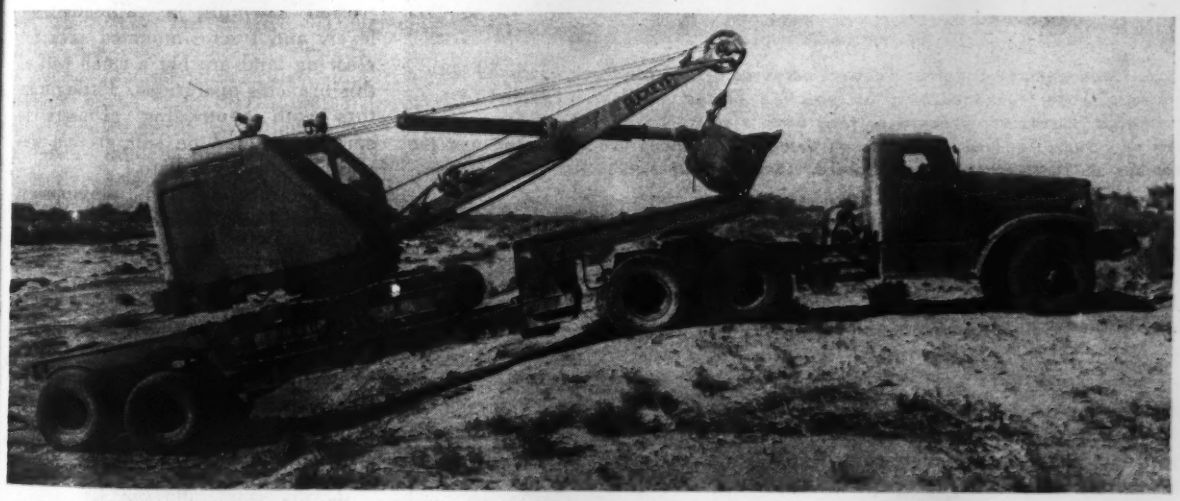


Fig. 5. Standard dual wheels replace conventional multiple-tire arrangement on front end loading, heavy-duty trailer. The hydraulic jack under the gooseneck collapses the front end into a loading ramp after prime mover has been taken out of the way. Some models have auxiliary power applied to trailer wheels by engine mounted at rear end.

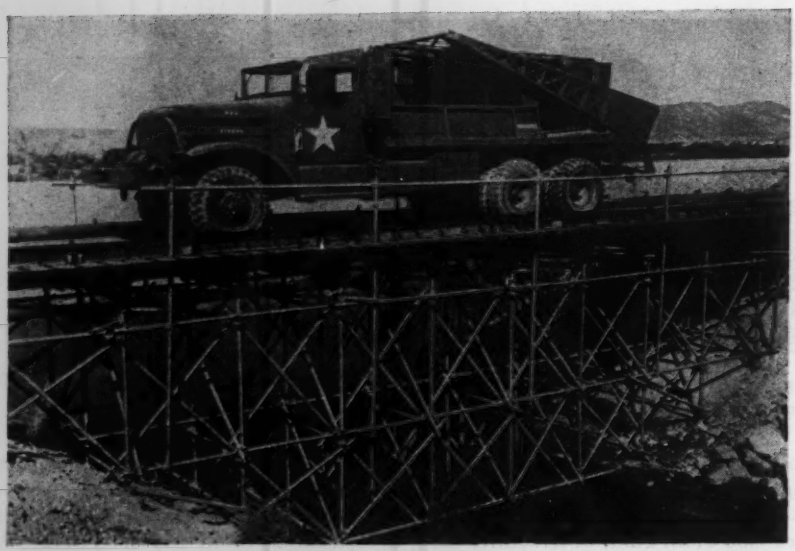


Fig. 6. Pipes clamped together (above) serve as bridge for truck equipped with a hydraulic boom for launching or erecting bridge sections. (Below) V-type fabricated trusses are erected so they have a single bottom chord for use as a deck structure. For use as a through bridge the trusses are separated and the floor system rests on the bottom chord. ***(See p. 102.)***

for cold weather accuracy, and winterization of equipment (enclosures and heaters) is examined for effectiveness. A good-sized commercial ice plant could be operated from the refrigeration plant required to service the temperature lab.

Work on new types of compasses, mine detectors, and many other electrical devices, such as remote-control starters for airport lighting plants, is being carried on in the electrical and radiation sections. The electronics branch is applying this new science to an amazing array of instruments.

The model shop is also under the camouflage branch. Here small working models of all kinds of equipment are produced for technical, operational and other training purposes and for study, such as methods of loading bridge and ponton materials on trucks and trailers. Here also are developed the new three-dimensional terrain models found so useful by navy, air and ground forces for planning purposes and in acquainting personnel with the terrain over which operations are to be conducted later.

Anti-aircraft searchlights, their control apparatus and their metal mirror reflectors are also the responsibility of the division. Reduction of the number of processes in forming metal mirrors is now under experimentation.

Under the direction of Lt. Col. Karl F. Eklund, Technical Division III takes in all heavy equipment, barrage balloons, foreign material and the Engineer Board shops. This division, largest of all, is split up into six branches and 37 sections. One of the biggest jobs of the mechanical equipment branch has been the adaptation of many commercial pieces of auxiliary apparatus to standard ordnance department trucks, and other equipment.

Other projects of the mechanical equipment branch cover a wide range. Important among them are the equipment repair shops varying from the 5th Echelon or base establishments to the completely-equipped motorized maintenance shops mounted on 2½-ton trucks. The idea of portability of repair shops has been carried to the seas, and now we have floating shops that can be moved from port to port. This branch also developed the amazing tankdozer which can do anything a bulldozer can with more power and far more protection for the operators.

Design of armor protection for construction equipment, the midget airborne units, a tilting blade bulldozer that operates with one end of the blade lower than the other, snowplows adapted to ordnance trucks, mule-packed sawmills, a railroad track layer, and tractor-mounted saws for clearing land are but a small part of this branch's operations. Fitting tractors with protruding grousers to spread the load on soft ground was another idea born here.

The transportation development branch is responsible for design of truck and trailer equipment to move fixed and floating bridge material, pipe and heavy machinery. It is also charged with design of fire fighting apparatus. Incidentally, with added protection for the crews, the tankdozer has been found the best bet for fighting ammunition dump fires. This branch has made numerous studies of pneumatic tire pressures and sizes.

The water supply equipment branch has one of the finest hydraulic laboratories in the country. Here water fil-

tration and distillation apparatus is developed, and foreign equipment is tested for efficiency. An air-drill rig has been found the answer to water supply problems at isolated spots, and a small water quality control set now enables sanitary engineers in the field to make quick positive tests as to potability and safety of any source of water. Methods have been worked out for removal of chemical agents from water, and this branch has a hand in designing the streamlined fabric water containers. The branch has also developed deep well pumps for 4 and 6-in. casings.

Technical Division IV, directed by Col. Carl W. Meyer, takes in floating equipage, fixed and floating bridges, structural design, military roads, cableways, landing mats, petroleum distribution lines, soil mechanics, and the Colorado River test station. Under floating equipage are included marine power, assault and work boats, and pneumatic and rigid ponton equipment, including bridges and ferries. Highway and railroad bridges of all types—trestles, girders, trusses and suspension—are the responsibility of the fixed bridge branch. Cableways and aerial tramways also come under this branch.

The structural design branch cuts across the organization lines of the floating and fixed bridge branches, and also works with consulting engineers, contractors and outside firms assigned certain bridge developments. Complete detailed drawings have been completed for large permanent bridges on the Ledo-Burma Road, if and when they are needed. This branch has just completed designs of a universal suspension bridge, suitable for spans from 20 to 600 ft. Also, if experiments now underway prove successful, it may be that the suspension bridge of the future will have no stiffening truss.

The petroleum distribution branch has developed the military pipeline systems that have proved so successful in all theaters of war. These systems are complicated for they include not only the main pipelines, but tanker unloading layouts, terminal facilities, storage stations and pumping plants as well.

The Service Division, headed by Major L. C. Verrette, takes care of the finances, personnel, property and security of the Board. It procures material and equipment for development work, operates a general design and drafting section and the photo reproduction laboratory.

Outside of the regular division organization there are two more branches, one designated as Control and Reports, the other as Legal and Patents. The first, under Maj. H. W. Brands, as chief, is responsible for compiling all the reports and manuals originating in the technical division. The second, under Maj. John W. Poteet, Jr., deals with patents, inventions and legal aspects of all items developed.

Major developments

Many projects, both completed and experimental, are still under the wraps of military security. Space limitations do not permit a description of all other developments, but the following is a brief description of the more important equipment and gadgets that have proved their worth in the battlefields of the world or that show promise in the experimental stage.

Mechanical Equipment

Included in this category are construction machinery as adapted to warfare, maintenance equipment and transportation units.

Tankdozer—Most spectacular of all mechanical equipment is the hydraulic bulldozer mounted on a Sherman medium tank—a husky bulldozer packing a wallop in both its blade and guns. The blade is the largest size standard model equipped with a heavy tripod against which a hydraulic ram on the front of the tank pushes to lift

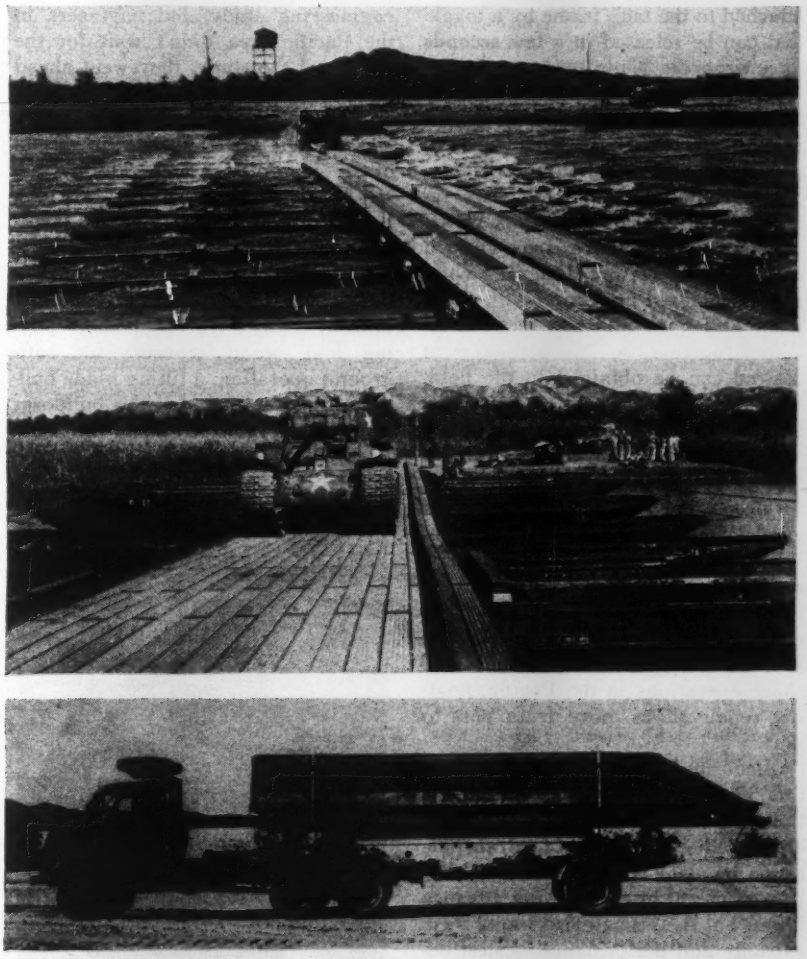


Fig. 7. The new M4 floating bridge is made up of aluminum box-section balk. Above, the balk sections are used as pontons and treadways for light traffic crossings. Center, balk forms the bridge deck, carried on two-part aluminum pontons. Below, a special rig for hauling the M4 ponton unit; the jointed pole connection steers the trailer wheels.

Fig. 8. Means have been found for "waterproofing" tractors with canvas and plugs so that deep-water fording is practical, with immersion as long as 3 hr.

the blade. Sidearms of the dozer are attached to the tank frame by a toggle that can be released in a few seconds to jettison the blade.

Armor and Winterization—For protection to the operators, tractor and roadgrader cabs have been enclosed in armor plate with bulletproof glass ports. As different war theaters requested various arrangements in armor protection, the Board met all such variations by simply designing completely enclosed protection with sides, front and back and top sections all bolted together, so any arrangement desired can be obtained in the field. Many kinds of construction equipment have been winterized, with enclosures and heaters, both hot air and coolant types. Tractors have been equipped for deep-water fording with protection good for about three hour immersion.

Maintenance Equipment—Repair shops, from fully equipped 5th Echelon base installations to compact but efficient shops on 2½-ton trucks are found in every theater. To serve the shore operations in the Pacific, floating repair shops move from port to port.

Airborne Equipment—Midget tractors, both crawler and wheel, scrapers, bulldozers, air compressors and welders, have been developed for transportation by plane and glider. They have proved useful in establishing advance bases, but their small size limits their capacity and performance. Latest development in airborne construction equipment is to cut up standard size rigs, fly them to point of use, then weld them back together again. Where and how to cut is now being made an engineering study, but engineers in the Pacific area didn't wait for the results of the study, they went ahead and cut, hauled and welded according to their own ideas. The airborne idea was carried a step further in design of air compressors and gasoline saw rigs for mule packing, the saw rigs being equipped with planetary transmissions instead of customary belt drive.

Tractor Gadgets—Militarizing the faithful crawler tractor includes adding long wood grousers for soft-ground operation, a tilting blade bulldozer, inside hitch for the bulldozer arms, a rail shoe replacing the usual grouser for railroad or off-rail operation, and a front-end cable hitch for dragging heavy guns and equipment (with sled pans under the wheels) across soft ground. The front end hitch tends to pull the front end of the crawler down instead of the back end, thus minimizing the tendency to bog down.

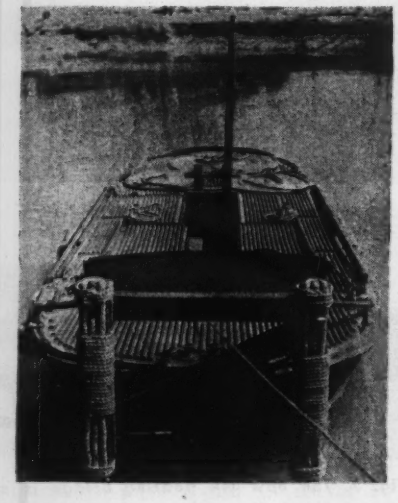


Fig. 9. Twin-screw power utility boat, highly maneuverable, is the latest development in army work boats.

Transportation Equipment—Design of military equipment and bridges is not complete until means have been developed for transportation. Standard ordnance department trucks and trailers have been modified to carry knocked-down bridges. One of the neatest of these is a truck and trailer unit for hauling a new type ponton bridge. Balk or floor sections resting on bolsters connect the truck to the trailer; pontons are stacked upside down on top. The customary reach or connecting pole is for guiding the two-wheel trailer only. It is jointed with a slotted connection. When the truck turns in one direction, this jointed reach turns the trailer wheels in the opposite direction, and the trailer follows along in the same tracks. It's the same principle as steering a long fire ladder truck from the rear seat.

Other refinements in transportation equipment include a gas-powered booster working on the trailer wheels that keeps the rig rolling at convoy speed on hills.

Bridging

The array of bridges, fixed and floating, developed in this war would both delight and confound the orthodox engineer, for they represent not only ingenuity and imagination, but also a liberal regard for stresses that often go almost up to the yield point of the metal.

Fixed Bridges—Latest in railway bridges is the V-type, suitable for either deck or through type spans from 20 to 90 ft. The trusses flare out at an angle like the sides of a V. In deck installations the trusses frame into a single bottom chord, and the floor system forms the top of the structure. For through spans the floor is set between bottom chords, and no top lateral bracing is required. It is of bolted construction with interchangeable parts, similar to the British Unit Construction railroad bridge we have adopted (*ENR* Oct. 19, 1944, vol. p. 477). Other standard railroad bridges include I-beam and Pratt truss spans, designed for field-assembly

Standard highway fixed bridges, all designed for rapid erection by bolting, include several types of girders and trusses up to 90-ft. spans, and also pipe trestles, all with wood decks. A recent development is a universal suspension bridge, good for spans up to 600 ft. Towers are sectional for any height, and pony trusses, which can be used alone for short span bridges serve as stiffeners.

Floating Bridges—Latest in floating bridges is the M4 or Division Army Bridge designed for vehicle loads up to 50 tons. It is extremely simple in that the balk, or longitudinal supporting members, are the roadway. Balk, 15 ft. long, are aluminum alloy box sections, formed by welding together the edges of two extruded channels. They are carried by two-section aluminum pontons, with extended end plates of the balk pinned to slots in the ponton gunwales. Balk are assembled skin tight with staggered end joints, resulting in a bridge of unusual lateral stiffness. The aluminum pontons are in two parts; each half section is a complete boat with one sloping rounded end and one vertical flat end. Two sections clamped together with square ends abutting form one complete ponton. Advantages of the M4 are greater load capacity than any previous floating bridge and a solid deck that will take vehicles of any gage and track or wheel width.

The M2 treadway bridge is the heaviest yet designed for pneumatic pontons, being good for vehicle loads up to 45 tons. Treadways, 45½ in. wide, formed of steel channels and open grid steel flooring, pin connected at the joints, can be used as short simple spans, as floating spans supported on steel saddles on pneumatic pontons spaced 12 ft. c. to c., or as fixed spans supported on adjustable steel bents. Pontons are rubberized canvas tubes 33-in. dia. made up into a unit 8 ft. 3 in. wide and 33 ft. long.

Floating Equipage

Utility Boat—The Army Engineers have developed many types of power boats for rafting and other work, but the latest is a twin-screw utility power boat that promises to eventually supersede the present standard 52-hp. unit. It is powered by two marine engines, each rated at 82 hp. at 3,200 rpm. The boat is of plywood construction, 26 ft. long and 8 ft. 8 in. wide, displacing 6,300 lbs. The twin screws permit a high degree of maneuverability; with one engine reversed and one engine ahead, the boat can turn on its own radius. Rigid and pneumatic assault boats of all kinds have also been developed by the engineers. Sections of all types of floating bridges are also utilized as rafts.

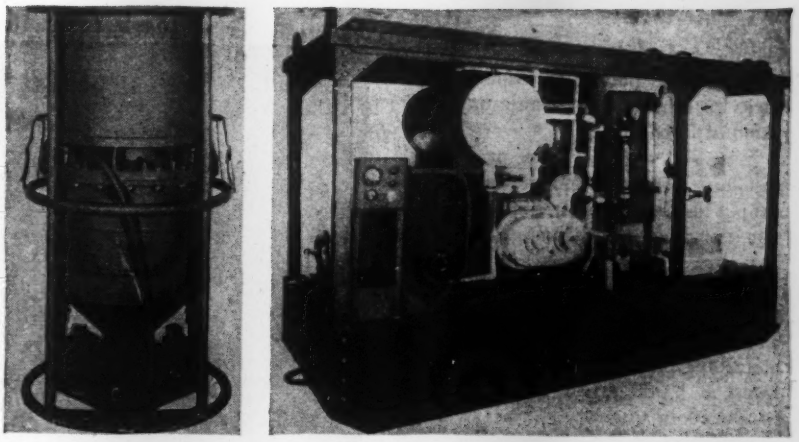


Fig. 10. Diatomite filter (left), simply a plastic core surrounded by a cake of clay, has licked amoebic dysentery for the first time by filtering out the cysts causing the disease. At right, thermo compression distillation unit that produces from sea water 150 lb. potable water per pound of fuel.

Floats—Pneumatic floats and pontons are of a neoprene-coated cotton duck with pressure vulcanized construction. New types include nylon and spun glass fabrics impregnated with synthetic rubber, which reduce weight and eliminate the necessity of mildew-proofing of the fabric.

Airport landing mats

Most successful of all the portable landing mats developed by the Board is the pierced plank type, consisting of ribbed steel sheets 10 ft. long and laying 15 in. wide (*ENR* Sept. 21, 1944, vol. p. 342). This same design has now been produced in 61S-T aluminum alloy to reduce weight and the interlocks have been improved to be self-locking, eliminating the spring clip formerly required.

Fabric Surfacing—Every other conceivable type of temporary runway surfacing has been tested by the Board, including laminated timber, fabrics, wire meshes of all kinds and various open grid steel types. The best fabric type has been used to surface fighter strips in France (*ENR* Nov. 9, 1944, vol. p. 592). It is an asphalt-impregnated burlap laid with a 50 percent overlap by a special machine that applies a solution of half gasoline and half cutback asphalt as an adhesive binder.

Military pipelines

Petroleum pipeline systems are made up of light-weight spiral welded or lap welded pipe of 4 and 6-in. diameters, laid on the surface and coupled with flexible type couplings. Heavier pipe of various sizes is used at terminal installations and for control station manifolds.

Centrifugal Pumps—In commercial practice pipeline systems use reciprocating pumps exclusively, and the earlier army installations utilized the same pumps. However, they were found to be heavy and cumbersome, so the Board investigated the possibility of centrifugal pumps. The standard 2-stage centrifugal was finally deemed satisfactory after some changes were made in packing, thrust bearings and the flow of liquid through the pump.

Water Supply

Various types of filters and hypochlorination units have long been standard engineer items. A new type filter utilizing diatomaceous earth as a filter medium is the first, however, that has proved effective in removing all cysts of *Endamoeba Histolytica*, the organism that causes amoebic dysentery. Septum elements are plastic cores surrounded by a diatomite filter cake. A small amount of diatomite is added as a slurry to the water being filtered to maintain the porosity of the elements. The 15-g.p.m. unit, in-

cluding a small gas-engine driven pump can be packed by nine men or three mules. Other portable units are rated at 50 g.p.m.

Salt Water Unit—The process of distilling seawater for potable water supply has been greatly improved with the thermocompression unit, which has increased the output from a former rate of 12 lb. of distillate per lb. of fuel to 200 lb. per 16 of fuel. Trailer and skid-mounted units rated at 1,200 g.p.d. and skid-mounted units rated at 3,000 g.p.d. are now being produced in quantity.

Gas generation plants

Oxygen and acetylene for welding and cutting, and nitrogen for flame throwers, are manufactured and bottled under pressure in large semi-trailer plants. Availability of these field units has eliminated the necessity for shipping thousands of gas-filled cylinders all over the world. Oxygen and nitrogen are produced in the same plant, with air as the principal raw material. Acetylene manufacture requires water and calcium chloride. Explosion-proof motors are used to operate the pumps and compressors. The semi-trailer plants, about 30 ft. long, weigh 16 to 20 tons and can be operated in forward areas.

Measuring and mapping

Instruments—Many new surveying instruments have been developed for engineer use. One is a theodolite that reads to one second of arc with possible estimates to 1/10 sec. Its chief advantage is speed, for one reading of an angle gives the same accuracy as multiple turning of angles with the conventional transit. Another new instrument is the pendulum astrolabe, utilizing the principle of dampening the pendulum by air instead of mercury, thus making it suitable for operation in extreme hot and cold weather conditions. It is an astronomical instrument that will determine the correct astronomic position of a point within 200 ft. of absolute correctness. A new zenith camera for photographing the area around the zenith and also determining astronomic position from the stars is accurate within 300 ft. of absolute.

Another greatly improved surveying instrument is a new type level, designed for fast use. The entire head does not need to be exactly level, as is the case with the conventional instrument, but when the telescope is placed in the line of sight it quickly can be brought to exact level by adjustment of a thumbscrew.

Fig. 11. Latest in photogrammetry is this arrangement of projectors for preparation of maps from high oblique aerial photographs.

Odograph—Automatic mapping by a jeep is now possible with the odograph, an instrument that plots the course of the vehicle, consisting of a compass, a plotting table and a power unit electrically connected. Distance from the speedometer and direction from the compass are integrated in the plotting unit and a map is automatically drawn of the course. This instrument has been found useful in mapping unknown road routes, and tying field artillery units together, and in general for determining the position of objectives as relative to a given base. The same idea has been carried further for use in mapping a traverse on foot by the instrument known as the pedograph. It works on the same principle of a compass for direction, with an electronic-actuated needle tracing the course. Distance is measured by a string played out from a reel on the instrument.

Aerial Maps—Photogrammetry has been greatly improved by developments at the Board. It is now possible to make maps from aerial photographs where control points are widely separated, by a process worked out for bridging the gap between the control. Another improvement permits accurate map making from oblique photographs.

Map reproduction and printing in the field have been made more efficient by new types of truck-mounted plants. Along with the map reproduction photographic units are now included.

Demolition

Experiment and development are constantly improving methods of demolition. Details of such processes cannot be revealed, but they include every conceivable type of explosive than can be pushed, thrown or hurled ahead of the troops for clearing the path through a mine field.

For detonating enemy mines, with a minimum of personnel casualties, many types of flails and sleds have been developed, designed usually to be pushed ahead of tanks or other powered equipment.

* * * *

This article has covered only a part of the project and items produced by the Board to increase the efficiency of our fighting forces. The work of the Board and its ability to constantly improve fighting and auxiliary equipment is a dynamic answer to the demands from some quarters at the beginning of the war that research and further development should be frozen and production concentrated entirely on products available at that time.

The challenge in

Rebuilding Our Cities

Harold M. Lewis
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***Contents in Brief**—Not the least stimulating prospect for the postwar era is the possibility of rebuilding our cities. Mr. Lewis provides a critical analysis of: (1) the need—because of physical obsolescence and the restoration of tax income; (2) the possibilities—resulting from local, state and federal participation coordinated with private interests; and (3) the steps that have already been taken in the right direction to promote urban rehabilitation.*

WHEN THE POSSIBILITY of a postwar depression is mentioned we are told by some people that there is plenty of work available—our cities all need to be torn down and rebuilt as their buildings are obsolescent and the whole city structure is out of date. But the recognition of slum areas and the need for their clearance and rebuilding is not new. We find records of both in early Egyptian and Babylonian history, several centuries B. C., including the execution of a scheme of reconstruction in the city of Nineveh. A proposal in 1748 to erect a statue in Paris in honor of the King of France led to many large reclamation schemes aimed to relieve the congestion within the fortified area. Baron Haussmann's system of boulevards, over a century later, achieved many of these objectives.

It is claimed by many that our cities should have been rebuilt for the motor age and should now be rebuilt for the age of air transportation. Some claim that we will not need large cities any more as everyone will live on a large plot, with his own garden; others tell us the day of the home owner is gone and we must hereafter live as a tenant in a superdevelopment where the whole community has been built as one operation and communal open spaces supplied. While some are talking about the need of more light and air others stress the use of artificial light and air-conditioned homes.

One may well stop to wonder which prophet is right. We would certainly be on safer ground to aim for what *we want* rather than what we think our grandchildren *may want*. In general, our cities have acquired a character that appeals to their citizens. The writer does not believe that the whole will be scrapped for something entirely new, but is convinced that there are large sections of our communities, both urban and suburban, which have for one reason or another become blighted and must be rebuilt.

Engineers were the pioneers in the building of our American cities. Some of the earlier ones, like George Washington, had much vision. Many have been so preoccupied with problems of the present that they have had little time to consider the future. Certainly all engineers engaged in municipal work, in the transportation services, and in the layout and development of land for any purpose, should appreciate the problems of blighted areas and take an active part in finding some solution for them.

What are blighted areas?

One of the broadest definitions of a blighted area is found in the Urban Redevelopment Law introduced in Congress by Senator Thomas in 1943, where it was stated:

"'Blighted' territory includes slums as they are defined in the United States Housing Act and other federal or state legislation but is not limited to slums and may include blighted districts, areas, or other territorial units to be redeveloped to any extent for industrial, business, or other non-housing uses, as well as for housing uses, or any mixtures, or combinations of such uses."

The outstanding visible feature of any blighted area is the presence of obsolescent structures, which have not necessarily reached that condition because of age, but largely because of failure of the owners to maintain them or keep them reasonably up to date. It has been estimated that one-sixth of the urban dwelling units in the United States have reached that condition of aggravated obsolescence which renders them unfit for decent habitation. There are certainly non-residential units that are equally unfit as places of work.

Some reports have described these areas as "decayed" areas, which is truly expressive of their condition. There may be many factors which have influenced their downward trend. They may be misfits in the city pattern, in that they represent wrongly placed uses—wrong from the point of view of normal city growth or the physical character of the site. In the latter group would be low areas subject to storm overflows. They may have been poorly planned in their street and block layouts and be without adequate open spaces. In most cases they have been seriously overcrowded with buildings and with people.

Certainly a common characteristic of blighted areas is that they no longer pay their own way. They have become municipal liabilities rather than assets. As a result, people have moved out of such areas, buildings have been abandoned, property has ceased to pay taxes and in many cases has reverted to the municipality. The areas show poor records in health, delinquency and crime. While, as a re-

Fig. 1. Rehabilitation of one section in the crowded Harlem River district in Manhattan, as proposed in this layout, would be initiated by the construction of a highway along the river front. Coordinated with this would be the development of a new commercial waterfront and a public housing project.

sult, they may have been bypassed in the expansion of the city they are in most cases amply supplied with utilities, such as streets, water, sewers, gas and electricity. If the era of rapid population growth is over, as many claim, our cities can no longer afford to duplicate these facilities in outlying areas but must find some way of bringing their blighted areas back to the black side of the municipal ledger.

Types of areas

One is inclined to think of blighted areas only in terms of crowded, urban areas, but there are other types. Some have become blighted due to an unfortunate scrambling of commercial, industrial and residential uses, a situation that might have been avoided under prompt and sound zoning.

A complete rezoning may still do much to revive such areas. Many suburban sections have suffered from a scattered, cheap development on small lots, which has held back attractive areas that might otherwise have been developed in a far more desirable and economic manner. Here again, zoning, coupled with planning, might have done much as a preventative.

In still other cases, large tracts of land have been prematurely subdivided, curbs, sidewalks and sometimes other utilities installed, many lots sold on installments and a purely speculative basis, and absolutely no development has taken place. Scattered lots have probably returned to public ownership through tax delinquencies, but the whole section has become just as truly blighted as the central areas described above.

What to do with blighted areas

Where central areas are involved the most obvious and practical solution is generally to clear and rebuild them as residential neighborhoods. City planning will show whether parts of them should preferably be devoted to business or industry. Certainly it is short-sighted to relinquish areas needed for industry or commerce for public housing, simply because they can be acquired at low cost. This has nevertheless been done in some cases.

Surburban blighted areas may need re-platting with larger lots, and in some cases with larger blocks; in almost all cases with larger areas set aside from parks, playgrounds and parking spaces. The only solution for some of the prematurely subdivided waste lands is to put them back into acreage in the hope that they may be used for some open type of use, such as farming, sites for institutions, air ports, or golf and country clubs.

Public housing has probably come to stay, but its proponents should not be permitted to grab sites more suitable for other purposes, including medium-rent private housing. In the long run the city's welfare will depend primarily upon a private housing program closely coordinated with its public housing requirements.

A rebuilding program

Any program for city rebuilding will involve three major steps. The first of these is a determination of those areas which need rebuilding. In most cases this essential preliminary has been well done. The real property inventories conducted in the thirties, together with other WPA projects, have determined and plotted areas with many old and obsolete buildings and with poor records in crime, health, etc. These surveys have been supplemented by the U. S. Housing Census of 1940, so that the fundamental data is available. Many cities have from these defined their blighted areas. For example, the New York City Planning Commission has, as an element of its master plan, adopted a map showing "Sections Containing Areas For Clearance, Replanning And Low Rent Housing."

The second step is the preparation of physical plans showing how these areas may be rebuilt. Here, again, we have a wealth of studies, some prepared by public agencies, some by unofficial planning groups, and many by professional groups.

The third step, and perhaps the most important as well as the most difficult, is to find ways and means of carrying out the plans within the selected areas. Here we get into legislative, financial and economic problems, and the way is not clear. This part of the program is necessarily still in the theoretical stage, as priorities on materials have made it impossible to carry out any plans. But the time may not be far off when materials and manpower may be available to start rebuilding our cities, and in the meantime we should develop to the full a practical program of ways and means.

Progress has been made

To indicate the varying approach to the problem in different communities a brief reference is given below to some typical examples.

In New York City a serious effort is being made to rebuild some of its blighted areas as determined by the master plan. Two large private redevelopment residential projects, both sponsored by the Metropolitan Life

surance Co., have already been approved by the city authorities. One these is a tract of 67 acres in the st-midtown area of Manhattan, ere Stuyvesant Town has been anned to house a population of out 24,000 people in a mixed area w used partly for residence and rtly for industry. In a Negro section of northern Harlem, Riverton uses, a much smaller project, will rve about 3,500 persons on a little er 12 acres. And a large area in st Harlem has been replanned by Manhattan Development Committee.

In the downtown and Civic Center ea of the Borough of Brooklyn, the anning Commission has developed replanning project which would assemble many small blocks into a few ger-blocks, most of which might be developed for residence, but some which would provide sites for public buildings and business structures. re, Commissioner Joseph D. Mcldrick proposed that the city condemn and acquire these blocks, replat em and sell them at public auction. yet the Board of Estimate is not dy to commit itself to such a procedure.

At the same time the New York y Housing Authority has planned $135,000,000 post-war program for panding its city-wide public housg program.

In Chicago the City Planning Comssion made a comprehensive land survey in 1942, as a WPA project. is supplied a vast amount of facl data and revealed the need for y replanning. It disclosed that re are 23 square miles of blighted d near-blighted properties which st be rebuilt within the next genation. This report was followed a master plan of residential land , published in 1943. Earlier, three as had been studied and plans preted in a 1941 report on "Rebuildg Old Chicago". Redevelopment ns based on neighborhood princis were worked out, the site areas ging from 92 to 225 acres. Other s have since been studied. At the sent time the Chicago Housing Auority is investigating, with private ncies, ways and means of rebuildg 320 acres for private housing.

Cleveland has within the past year veloped an urban rehabilitation ogram under the sponsorship of its planning commission. Areas have been classified for protective measures, for neighborhood conservation (which would include repair and modernization of buildings) and for complete urban redevelopment. Maximum limits on population densities have been recommended for each of the last two types of areas. The replanning will be based on neighborhood principles, with ample provision for recreation, schools and other neighborhood facilities, and local retail business. (See "An Urban Rehabilitation Program For Cleveland" by John T. Howard, *Jour. of The American Institute of Planners*, Autumn, 1944.)

A study for rebuilding the Waverly section of Baltimore, Md., made by the Federal Home Loan Bank Board in 1940, set a high standard for a method of approach in analyzing and replanning a blighted neighborhood of relatively low density. Situated in the outskirts of Baltimore it involved a community of 7,000 persons, housed in single-family or row housing. The study was undertaken in the hope that it would serve "for the inspiration and guidance of other urban communities and agencies which are seeking an effective preventive remedy for their slum problems."

A quite different type of project has been developed by H. B. Zachry, a Texas contractor, for clearing and rebuilding a shanty town in the Mexican section of Laredo, Texas. (*ENR* June 29, 1944 vol. p. 950). It is proposed that the city work through its own housing authority, which would declare the site a slum area with substandard buildings. A district of 600 acres is involved, which would be entirely cleared, replanned, rezoned and rebuilt. No public subsidy would be needed but FHA insured mortgages would be obtained. The reconstruction would be on the basis of competitive bids.

Stony Brook, Long Island, offers an example of a planned project that has been carried to fruition. Here the business and civic center of a rural community was on the down grade. A local group under the leadership of Ward Melville, in cooperation with the local merchants and property owners, developed and carried through to completion in 1943, with local labor and materials, a complete rebuilding of the civic center and local retail stores, grouped around a new village green. It was built as a completely cooperative project, the deeds to all the properties being lodged in a Community Fund. (See *The American City*, January, 1944.) It provides an example on a small scale which should be equally effective in a larger community.

Legislative progress

Legislation to pave the way for urban redevelopment has involved both state and federal laws. Regarding the former, New York led the way, the Association of Commerce and Industry taking the leadership in drafting a bill for official considera-

Fig. 2. Creation of residential neighborhoods is an obvious and practical solution in dealing with the problem of blighted areas in the central section of cities. Twelve blocks of congested slums were cleaned out to make room for Williamsburg Houses in Brooklyn.

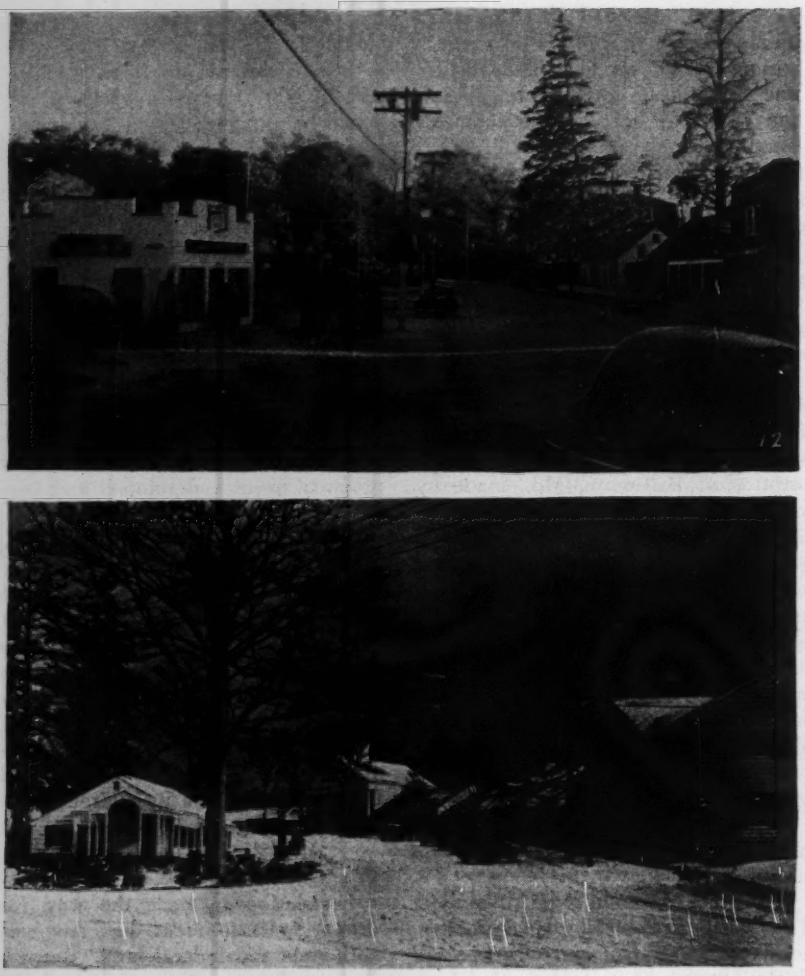

Fig. 3. Before and after the rebuilding of the business center of Stony Brook, L. I. What was done here on a small scale is said to provide an example of what might be undertaken in larger communities.

tion. This led to the New York State Urban Redevelopment Corporations Law of 1941, followed by the Urban Redevelopment Companies Law of 1942. The first was aimed at encouraging investment capital and large-scale builders to set up corporati ns for private redevelopment, while the second was aimed specifically at the insurance companies. While the first offered tax exemption for ten years on increased values, the second provided for such exemption up to a maximum period of 25 years. Somewhat similar laws have been adopted in several other states, including Kansas, Kentucky, Maryland, Michigan, Missouri and Wisconsin. An Illinois law has been declared unconstitutional. New laws are pending in Indiana, Ohio and Illinois.

Most of the states have housing laws under which blighted areas can be rebuilt for public housing, and in many cases these also provide a basis for private redevelopment.

For the last two years efforts have been made to adopt federal legislation to pave the way for urban redevelopment by municipalities. There are still pending two rival bills known as the Thomas bill (S. 953) and the Capper-Randolph bill (S. 1930—H. R. 4847). Both of these assume that some form of federal or state aid is necessary to finance the assembling and clearance of blighted areas before they can be rebuilt. They also stress the needs of local responsibility for the replanning of the assembled areas and the disposition of the replanned land.

In all this legislation it has been assumed that the power of condemnation is a fundamental necessity before any urban area can be rebuilt. Perhaps this is not as important as first thought. We have had several years' experience in public housing and housing authorities were all granted this power of condemnation on the same assumption as to its essential need. Their experience, however, has been that the importance of this need is largely theoretical and held as a last resort, for the general practice has been to assemble the necessary lands by private negotiation and not by condemnation. Undoubtedly the same will be true in assembling property for private redevelopment.

Certainly some joint participation at the federal, state and local levels of government is essential, even though the exact form of that participation is still a matter of controversy. There seems to be general agreement that projects should be initiated locally and that the municipalities should undertake such projects only on the basis of a carefully considered city plan. If public subsidy in the form of grants is essential this would seem to be primarily a state responsibility, whether the money used be state or federal. The writer believes that federal participation should be limited to essential research, aid in standardizing state and local legislation, the insuring of mortgages, and the use of direct federal credit only as a last resort.

The situation in brief

In conclusion, the following points stand out clearly:

Most of our cities have grown without a plan, which has led to present-day congestion of traffic and of housing.

Many of our citizens are living today in sub-standard dwellings, are working in congested districts and are wasting much time traveling at discomfort between the two.

Extensive blighted areas should be rebuilt as part of an over-all city plan that recognizes probable future growth, or the loss of population, as the case may be.

The same problems, in various degrees of intensity, are found in urban, suburban and rural districts.

Only through some rebuilding program can communities be stabilized in character and land be stabilized in value.

What's behind

This Job of Local Postwar Planning

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Editor's Note—Here is a unique story of the experience, perplexities and accomplishments of local public works planning agencies who are endeavoring to prepare postwar construction programs in Michigan. From the background of consultation with more than 100 planning groups, Professor Townsend is equipped to provide a sympathetic appraisal of the obstacles that beset postwar planners in the smaller communities. On this basis he provides a critical analysis of what has been done and makes recommendations as to how future performance may be improved.

SPARKED by a five million-dollar state legislative appropriation to help finance postwar planning costs of local units on a state-wide scope, the local government organizations of Michigan's Upper Peninsula region have rounded out the rather creditable showing of some 275 public projects aggregating a total postwar construction outlay of $24 million, but completion of the program is strictly contingent on outside financial aid to cover the major part of building costs. Stating the story in such brevity leaves untold many troubling and trying perplexities that beset some 100 planning groups in this region. Principally because the experiences and reactions of these bodies have been, in all likelihood, typical of such agencies everywhere, a general account of what was done, the final accomplishment, the difficulties encountered, and some lessons learned in this area are worth recording.

At the onset, the blighting influence of financial expediency—a retardant everywhere—condemned prematurely to a disheartening death the planning hopes of many otherwise interested communities. Elsewhere, technical help was found difficult to corral. And in a number of important instances citizen participation on planning groups encountered obstacles extremely difficult to surmount.

Territorially, Michigan's Upper Peninsula is a substantial segment of the nation's land area.

With an expanse only slightly less than that totaled by Massachusetts, Connecticut, Delaware, and Rhode Island, the area has fewer inhabitants than one-half the population of Boston. In 1940, 324,000 persons lived across the Straits of Mackinac, residing for the most part in the western half of the Peninsula. By 1944, down-state war industries, selective service, and enlistments had drained away 20 percent from the 1940 census figure. Of the remainder, slightly more than half live in incorporated communities, among which the largest has a scant 16,000 population.

A plan for planning

Within this general setting has progressed postwar planning for local public projects. Substantial state aid has been made available in these preparations by the Michigan Planning Commission. This agency was created by the state legislature in 1937 and then expanded in personnel and functions in 1943 to engage in activities designed to cushion within the state the economic aftermath that is anticipated following the war.

For the most part, the services of the state planning commission at the local level have taken the form of promoting and directing the organization of special planning groups within the community, giving help to obtain technical assistance in the preparation of engineering and architectural plans, and provide instructions on procedures to obtain state financial aid on a dollar-matching basis to partially defray planning costs. For this latter purpose $5 million of state money has been made available to Michigan's 8,000-odd small government units. The amount originally apportioned to the northern section, mainly on a population basis, was approximately $406,000.

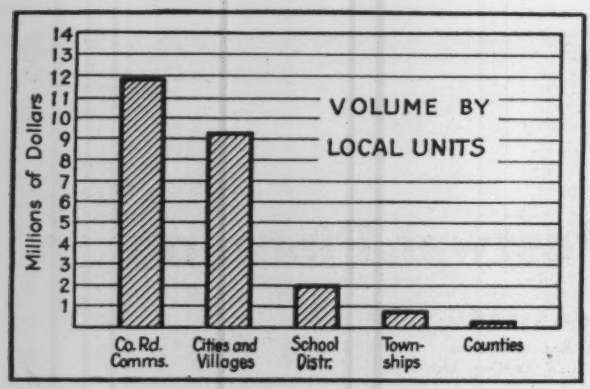
In March 1944 the Michigan College of Mining and Technology established a postwar planning consultancy service for the Upper Peninsula under the direction of the Michigan Planning Commission. Designated to direct this work as the Commission's field representative in the area, the writer spent the better part of two weeks in the state capitol familiarizing himself with the objectives and procedures of the Commission.

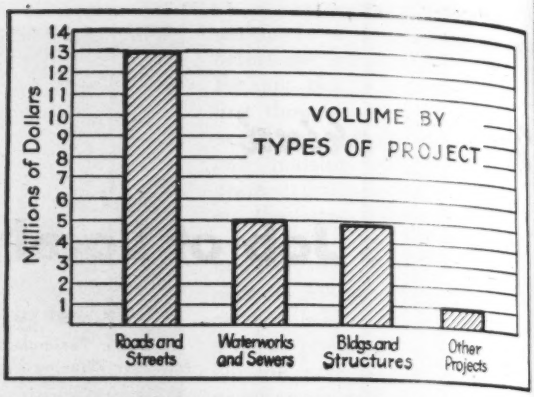
Returning up-state, the writer was able to devote four months full time and nearly three months on a part-time arrangement in furtherance of the Planning Commission program in this region. As an operational outline, it was originally planned to make at least three personal contacts with the planning group of each community in which interest was indicated.

The first was to be a preliminary visit promoting, where not already established, a special agency to direct the postwar planning activities of the community.

A second call was intended as a follow-up. It was to give information on specific assistance extended by the State Planning Commission; it was also to provide instruction on established procedures for obtaining such aid.

Finally, a third contact was believed desirable in a number of cases. Its purposes were: To give personal help in filing applications and vouchers; to offer general aid in locating





Distribution of proposed postwar projects in the Upper Peninsula region of Michigan. At the left is shown the relative accomplishments of various types of local government units; at the right is the distribution by types of projects.

available engineering and architectural service; and, where needed, to give advice on the required standards for planning documents necessary to obtain state-apportioned planning funds. Over 300 contacts were made with community planning groups and representatives of local governing bodies. This coverage included 175 of the total 416 local government units in the area. Making up this total are 195 school districts, 150 townships, 21 villages, 20 cities, 15 counties, and 15 county road commissions.

Road projects head list

Planning details for some 87 of these agencies are entrusted to specially created planning bodies. For the remainder, this function is administered by the governing groups themselves. Excepting a very few instances, all the communities that were seriously considering future projects were visited at least once during the period since the planning service was inaugurated. The data accumulated in this interim, complemented with additional information from the State Planning Commission office in Lansing, gives what is believed to be a well-rounded picture of proposed postwar construction in the northern portion of the state.

A breakdown of tne estimated overall $24 million construction outlay among the participating units gives the following analysis:

1. Leading the list both as to the number of projects sponsored and dollar volume of construction are the county road commissions. These units account for approximately one-half the total number of proposed projects and about the same percentage of the total construction volume. The ascendancy by the road commissions over the other units may be explained as follows: Most of the commission work will be expended on roads, and quite frequently the road agencies have listed different sections of the county highway system in need of rehabilitation as separate projects. Moreover, thoroughfare transportation is one of the prime needs in any region, and it substantiates expectation that this type of construction would bulk large in a general public works program. It is true that the engineering staffs of the road commissions have in many cases been drastically depleted because of military and other exactions. However, largely because of the nature of their work, these agencies, in general, have been better equipped, better informed, better trained, and better organized to proceed with the task of planning.

2. Cities and villages ranked second in the category of local government units accounting for one-third of all the projects and nearly 40 percent of the total construction volume. The runner-up position of the municipalities can be attributed, no doubt, in lesser degree to the same reasons for which the road units predominate.

3. Spaced considerably down scale from the two above groups appear the school districts. They contribute 10 percent of all projects, but somewhat less than this proportion of the overall construction volume. As a group, school districts were not in great need of new building facilities.

4. Townships as a group place fourth. They muster 20 of the approximate 275 total projects and marshall about 3 percent of estimated project value for the entire region.

5. Safely stationed at the end of the list are the counties. These, according to data now available, have planned four projects with a proposed financial outlay aggregating less than 1 percent of the $24 million total. Quite likely this minor showing is partly attributable to the fact that the county is relatively a coordinating rather than an operating agency. But no less important is an acute limitation of financial resources that is especially peculiar to counties—although the characteristic is strikingly typical of all local units throughout this section of the state.

Some of the obstacles

The problem of obtaining construction funds is the outstanding obstacle confronting a postwar public works program. So formidable is this obstruction that substantial monetary aid from federal or state coffers, or both, is the *sine qua non* of local public works construction in Michigan's up-state area.

To realize the construction of proposed projects, financing from outside the local units cannot be less than a major portion of the total. This assertion might give rise to the question of whether or not any planning with such inadequate provision for financing should be given serious consideration. Should ability to pay for public works be an adequate measure of necessity, then it can be flatly stated that there are no local public needs in the Upper Peninsula excepting, perhaps, a few revenue-producing utilities.

Such a statement is quite obviously unsatisfactory. A more likely assumption is that local units are unable to foot the bill for a schedule of desired public works because of the inade-

te foundation of local government nce. In Michigan, with its constitonal limitation of a 15-mill property tax, the problem of local finance particularly acute. And it is not ly to improve until the sources n which local government revenues inate either are enlarged or exded. Before such a development, unlikely that local units will be able of independent planning and structing an adequate public works gram.

he scarcity of technical service in preparation of plans has occaed delay in completing surveys, wings, specifications, and estis, although this difficulty is not to be a major obstacle in the program. Much of the engineerfor roads, streets, sidewalks, etc., road commission and municipal ects is being assumed largely egularly employed personnel and e small number of available local neers. Sewage disposal and water ly programs, however, usually ire the retaining of specialized neering firms whose services at nt are in relatively high demand. nship projects are largely engied by the staffs of county highway rtments. Regarding the architecl needs of communities, it appears these will in general be quite ly cared for.

Smaller communities active

tensive confusion and ineffecess might be a logical anticipafrom planning groups staffed ly with laymen who were for the part without special training rather exacting task. In general, ver, this was not the case. In no general statement provides a factory summary. For among the ges and rural communities the ning organization where utilized relatively active and effective. was lacking in technical undering was compensated by public st and unity of purpose.

this regard the record of cities impressive. Only four, or posfive, of the 20 cities in the Up-Peninsula have used planning missions with notable success in oping public works programs. eason may not be readily ascerd. However, it is quite likely he number of projects involved, iverse nature of municipal needs, he greater complexity of planning problems constitute a greater planning burden than a citizen planning group can be reasonably expected to shoulder. The fact remains that the bulk of municipal planning in the region is being accomplished by city managers, city engineers, and in several instances by officials bearing the title of superintendent of public works.

Invariably an attitude prevails among the specially created planning organizations is to consider their purpose and function fulfilled after selecting a list that comprises the more urgent public improvement needs and after submitting the same to the local governing body for adoption or rejection. Such a limited performance might logically spring from the community's inability to afford anything more comprehensive or elaborate. As a general rule, to provide even a few of the more immediate public needs is to bind the community to a financial outlay beyond its ability to handle.

While perhaps understandable, the functioning of local planning commissions has not, in Northern Michigan at least, attained the standard that was set up in a state legislative enactment (Act 285, P.A. 1931 as amended)—a law which empowered municipalities to create local planning agencies. These bodies were intended as permanent organizations. With membership appointed on a staggered basis, they were authorized to hire employees, contract with professional planners, engineers, and architects. Also, they were empowered to formulate and prepare a master plan for the municipality and in general to direct the public development of the community. Without adequate financial provision all such powers are, of course, meaningless. And quite likely the limited objective adopted by the local planning groups in this region is but a practical acknowledgement of this fact.

Planning by the local school boards has been affected by the Michigan Education Study Commission plan for state-wide reorganization of existing districts into larger administrative units. As a result of this incomplete reorganization, planning decisions within this group have, in some instances, been delayed. School boards have been faced with the uncertainty of the extent to which educational facilities would eventually be necessary and of the most logical site for their location.

Fewer planning difficulties were encountered by the county road commissions than confronted the other groups, although, quite naturally, highway agencies were not without their problems. For the most part these were limitation of funds and shrunken engineering staffs.

However, because of extensive practice and experience in future planning, and because of a trained, although decimated, engineering personnel familiar with highway aims and operation, these agencies have achieved relatively marked success in coping with planning obstacles. Of further inestimable significance to the road planning program has been the coordinating influence and the central services of the state highway department. These benefits are largely advisory, informative, technical, and financial. Moreover, this central agency for years has provided direction and objectivity for highway planning, construction, and operation throughout the entire state.

Improvement recommendations

The example might well be instructive. Municipal public works planning and construction may conceivably need a state-wide integration which will incorporate the main characteristics that have contributed to the success of the public highway system. To effect a comparable degree of achievement, this would appear a logical development.

Municipal planning commissions, like county road commissions, should have a small membership in order to enlarge individual responsibility and to encourage greater promptness in decisions. Besides, a greater appeal could be made to persons of capability and accomplishment. A commission comprising a small number of competent parties need be no less democratic than a larger and perhaps less informed body. In addition, it has the greater likelihood of being more practical and realistic.

Functionally, municipal planning bodies should be essentially policy-forming agencies. Such was the intent of the Michigan Act 285 of 1931 mentioned earlier in this article. Administrative detail and planning work, in accordance with sound principles of management, should be entrusted to employed personnel.

Where we stand on

Collective Bargaining for Engineers

V. T. Boughton
Associate Editor, Engineering News-Record

***Contents in Brief**—Collective bargaining became a very live issue among civil engineers about 15 months ago when the American Society of Civil Engineers authorized its local sections to sponsor and aid collective-bargaining units of professional engineering employees when such action seems necessary. Events leading up to and following the A.S.C.E. action are summarized in this article and the present situation with respect to collective bargaining for engineers is appraised.*

ABOUT a year and a half ago the American Society of Civil Engineers took the unprecedented step of recommending to its local sections that they sponsor organizations that could aid engineering employees in collective bargaining with their employers should such bargaining become necessary to protect the rights of those employees or to advance their welfare. Although that action was the culmination of a careful study of employment problems extending over many months, it came to most engineers as a distinct shock because the society's study of the subject had received little notice except on the part of the few who knew that national trends in labor relations were shaping up to the disadvantage of professional employees such as architects, chemists and engineers.

Action not understood

To most professional people, collective bargaining and unionization were synonymous. Collective bargaining meant strikes and lockouts and labor racketeering. That a national engineering society would have any part in collective bargaining, therefore, seemed incomprehensible to them.

What brought the A.S.C.E. action to a head was a condition affecting engineers employed on construction of the Sunflower Ordnance Works in Kansas. However, the society's consideration of the subject goes back to the early days of the National Labor Relations Act when it began to be apparent that the union movement would spread under the guarantee of collective-bargaining rights assured by that act, and that the spread ultimately would engulf engineers, especially those employed by large corporations.

An economic question

Seven years ago a small A.S.C.E. committee, set up to study the possible effect of the union movement on engineers, reported that union membership was an economic rather than a professional question, that under the National Labor Relations Act an engineer might find it necessary to join a union in a completely unionized company in order to hold his job, and that, consequently, the fact that an engineer was a member of a labor union should have no bearing on his relation to the society. The committee stated further that union membership was not necessarily a bar against a professional approach to an individual's work.

By 1942 the anticipated spread of the union movement was reaching more and more professional people, including younger members of the A.S.C.E., who found that the issue of union membership was far from an abstract one. Company-wide unions were being organized in many of the larger manufacturing companies, whole city engineering departments and state highway departments were being organized, and the movement spread even to the staffs of some of the larger consulting engineering firms. As a result, a small committee of the board of direction of the A.S.C.E. that had begun a re-study of the subject, was expanded and set up as the Committee on Employment Conditions. Subsequently, the assignment of Howard F. Peckworth of the A.S.C.E. staff was changed so that he could devote a considerable part of his time to employment matters.

The shift of civil engineers from peacetime pursuits to war industries and the construction of great war facilities helped to force action on the part of the A.S.C.E. Construction men went into shipyards only to find the operating companies fully unionized, making it necessary for them to join a union in which they were a small minority with no effective voice. Others found a like situation in manufacturing companies. Further complications grew out of efforts of the unions to organize the employees of the big war construction jobs.

Separate recognition sought

The Sunflower Ordnance Works at which the A.S.C.E. first took a hand in collective bargaining was one of these war construction jobs. The salaried professional men on the work had signed up with the International Federation of Technical Engineers, Architects and Draftsmen's Unions, an affiliate of the American Federation of Labor, and they claimed bargaining rights for the professional men. This left the professional men who did not care to join the union without a voice in matters affecting their pay and working conditions, unless they could set up an organization of their own and get it recognized. This they sought to do, and their efforts received the support of the American Society of Civil Engineers.

It is not necessary to review the e in detail here. The group lost cause its members had not been dy to act when the T.E.A.D.U. be- its organization activities. The ar Labor Board panel that heard its peal said in effect that had the engi- ers sought separate representation en the question of representation the technical men came up, they uld have been recognized. By not ting for nearly a year, they had itly accepted representation by the ion.

Bargaining groups authorized

That event served to crystallize the wly forming realization on the t of engineers who were studying unionization movement that if en- eers were to be in a position to tect their own rights and to speak themselves in employment mat- , they must be prepared to set up ir own collective bargaining units. plan approved by the board of ection of the A.S.C.E. in Atlanta October, 1943, was the result.

Briefly, the board recommended the sections of the society that they end their constitutions to permit establishment of a committee on ployment conditions, which com- tee would be authorized to act as collective-bargaining agent for ofessional engineering employees." bsequently, the plan was modified terially to minimize the possibility employer domination of collective gaining. Under the modified plan section's committee on employ- nt conditions can sponsor the or- ization of "collective bargaining ups" made up of professional en- eering employees, including non- mbers of the section, which groups urn can aid in creation of "collec- bargaining units" among the em- yees of any one company.

ventually, 30 of the society's 64 ions amended their constitutions, others have set up committees on loyment conditions under the dified plan, and the matter still is ding in other sections. Only a sections have found it necessary set up the collective-bargaining ups and units.

ne of the early questions that was ed concerning the A.S.C.E. pro- was whether an organization as the A.S.C.E., which is com- d of both employers and employ- could sponsor such collective- aining units without having their effectiveness destroyed when they came to function by the charge that they were employer-dominated. In the past few weeks, William H. Davis, chairman of the War Labor Board, has said that such is not the case.

Chemists establish a precedent

Meanwhile, the American Chemical Society had attacked the problem from a different angle. In the laboratory of the Shell Development Co. at Emeryville, Calif., C.I.O. organizers attempted to include the professional workers in an organization made up of professional and non-professional men. The professional workers opposed this, and with the help of able legal talent employed by the American Chemical Society succeeded in being excluded from a requirement to join that union. Thus a precedent was established that is of value to engineers seeking separate recognition.

In a somewhat similar case, the National Labor Relations Board gave further recognition to the peculiar position of professional men when it said of employees in the engineering and production-control departments of the Northrop Corporation: "Many of the men employed in the non-clerical portions of these two departments are college graduates, and regard their positions as careers. The economic interests of these workers and their relations to the company are on an entirely different plane from those of production workers."

Exemption sought

Many engineers hold that engineering employees should be exempted from the provisions of the National Labor Relations Act, and they would have organizations like the A.S.C.E. set such exemption as an objective. The weakness of such a procedure, however, lies in the fact that many professional men, especially in the larger corporations, need to act collectively to protect their rights. And if some of them who find themselves in that condition decide to cast their lot with a union, the others stand the chance of losing all voice in matters relating to their pay and working conditions if the union thereafter claims the bargaining right for the professional men and is not successfully challenged by an organization of the professional men.

In this connection it is of interest to record the fact that in the Shell laboratories the professional workers, since winning their case, have established the Association of Industrial Scientists to act as a collective-bargaining agent for them.

Another instance in which a union undertook to claim bargaining rights for the professional men occurred last year at the Clinton Engineering Works in Tennessee. When construction of that great project got under way, the T.E.A.D.U. began an active campaign to sign up all the technical employees, including the civil, electrical and mechanical engineers employed by the prime contractors, a movement that was immediately opposed by many of the engineers, although a few signed up with the A.F. of L. union.

Tennessee engineers act

As the Tennessee Valley Section of the A.S.C.E. already had amended its constitution in order to be in a position to meet such a contingency, the section immediately organized a collective-bargaining unit known as the Tennessee Association of Professional Engineering Employees, which unit began actively to sign up engineers on the job. Subsequently, the T.A.P.E.E. signed contracts with two of the contractors as collective-bargaining representative of the professional engineering employees. These agreements were challenged by the T.E.A.D.U., but the union did not press the challenge to the point of asking the National Labor Relations Board to hold an election to determine which organization was to represent the professional men.

Subsequently, when questions as to pay and compensation of the technical men on the job came up, the panel set up by the War Labor Board to consider and pass upon the issues raised heard both the representatives of the T.E.A.D.U. and the T.A.P.E.E., thus in effect giving formal recognition to the latter as spokesman for the professional men.

An interesting sidelight of this case and one pointing to the fruitlessness of attempting to have professional engineers exempted from the provisions of the Wagner act, is the fact that the man who represented the T.E.A.D.U. before the War Labor Board panel is a licensed professional engineer in the state of New York. Were the national engineering societies to undertake to amend the Wagner act to have engineers exempted from its provisions, they would find

themselves up against well-organized opposition from men such as this man who hold that as professional men they need the act's protection. They could be expected to argue with much force that the employer-dominated engineering societies were seeking to have the law amended with the selfish objective of keeping their own employees from being able to organize and bargain with them collectively.

Against such opposition it appears obvious that efforts to amend the Wagner act in this way would be wholly wasted.

Professional societies inactive

During the years since the National Relations Act was passed the state and national professional societies, which presumably should be more interested in matters affecting the economic status of engineers than are the technical societies, took little or no action to strengthen the position of engineers under that act. This doubtless was due in part to their weak position numerically and financially, but the basic cause appears to be the belief that somehow engineers will lower their dignity and professional standing by a realistic approach to collective bargaining.

Until last year, similar inaction characterized the three large engineering societies other than the A.S.C.E., the mechanical, electrical and mining engineering societies. Last year, apparently as an outgrowth of the stir caused among its younger members by the A.S.C.E. action, the American Institute of Electrical Engineers undertook to make a survey of the economic status of engineering employees as a means for determining the extent to which such employees might need to resort to collective bargaining to maintain their economic standing. Subsequently the American Society of Mechanical Engineers joined in the study, and more recently the American Society of Civil Engineers expressed its willingness to participate.

The outcome was establishment of the Joint Committee on the Economic Status of the Engineer. Future plans of that committee still are tentative; they include a salary questionnaire to be sent to members of the three sponsoring organizations and possibly to other engineering and scientific societies if they wish to participate, a questionnaire on employer-employee relations, and a manual covering the rights of engineers under the National Labors Relations Act. Work on this manual is under way.

Similar manuals have been prepared by the American Chemical Society, the American Society of Civil Engineers and the American Association of Engineers. The latter is the most comprehensive of the three. It is a paper covered book of 270 pp. entitled "Technologists' Stake in the Wagner Act."

Union recognizes new trend

While most of the technical and professional societies continue to mark time, the Federation of Architects, Engineers, Chemists and Technicians, with characteristic acumen, has begun to lay the groundwork for an internal reorganization that will give professional men the independence from sub-professional men that they appear to want, thus making it easier for professional men to affiliate with a trade union. Little yet is known of the plan, but it is believed to call for an autonomous organization of men in the professional grades within the F.A.E.T.C. structure.

That such an organization will be acceptable to many engineers having professional leanings and yet in need of some form of collective-bargaining agency does not appear probable due to the radical background of the F.A.E.C.T. and its close tie to the C.I.O. Nevertheless, it is a possibility not to be overlooked in considering future trends.

What of the future?

One of the objections raised to the A.S.C.E. plan for aiding engineers to set up their own collective-bargaining units was that it would create ready-made organizations for trade unions to take over. Such an event is not improbable, yet the possibility that such might happen does not of necessity make the A.S.C.E. action undesirable. Men in an organization with the high standards of the bargaining units the A.S.C.E. proposed to set up would hardly go over into a union unless the union would let them come in without materially lowering their standards. Hence the effect might be that of raising union standards.

It does not appear probable that many independent collective-bargaining units will be set up under the A.S.C.E. plan, and there is good reason to doubt that such as have been set up or are set up will survive very long unless they can be united with like groups of professional employees in some such organization as the Association of Industrial Scientists. If a strong national organization is to develop to tie the independent group of professional men together, it is more likely to originate in the industrial field, for many more engineers will be affected by the union movement there than in the field of civil engineering. The alternative is for one of the existing trade unions to set up an organization acceptable to professional men.

Effort not wasted

In saying this there is no intent to imply that what the A.S.C.E. has done is wasted effort. What it did and what the American Chemical Society did were important contributions toward assuring engineers and other professional men independence from domination by unions in which they could have little voice. If those engineers want to go on from here as individuals having no affiliation with collective-bargaining organizations, they can do so; if they want their own independent units they can have them if they are willing to finance them. Those who want neither, who are satisfied to throw in their lot with existing unions, also can do that.

The important fact to recognize is that collective bargaining is here to stay and that engineers, like everyone else, must harmonize their attitude and action to that fact. The action taken by the A.S.C.E. and the A.C.S. is but one step in this adjustment. Neither society has any desire or any intent to change its basic character and function. Each stepped in because there was no organization better fitted or able to act. What happens from here on will be more and more the responsibility of the men for whom collective bargaining is a real issue. No society run by men not directly concerned with collective bargaining can long carry the ball. A way has been opened for independent action on the part of professionally minded engineers, architects and chemists. If enough of them want such independence in collective-bargaining matters and are prepared to support a bargaining agency, they can have it. The choice is up to them, not the technical or professional societies.

REDEDICATION

An Obligation to Our Fighting Men

During the last few weeks we have been forcibly reminded that so long as we still are fighting either of our major foes, first claim upon the productive resources of the United States—its manpower, materials, utilities, and industrial facilities—must be the production and delivery of munitions and war supplies. All other claims are secondary. No responsible citizen would have it otherwise. For in this war even more is at stake than our existence as a Nation. We dare not forget that we are engaged in a struggle that challenges the fundamental values upon which our civilization has been built.

It is not easy to list the values that we are fighting to uphold. They have been clothed in a variety of shapes over the centuries. They will assume new forms in the years ahead. But they have an inner consistency that free men the world over can feel and recognize: the right of the commoner against the noble, the right of the individual against the state, the right of trial by jury, the right to vote, the right to an education, the right to freedom of speech and worship, the right to work in a sphere of one's own choosing, the dignity and the equality of the individual under the law—these are our cultural heritage, painfully won and often precariously held over the ages, always to be rewon, redefined and buttressed by each succeeding generation of men.

The preservation of this vital core of value, and its transmission to our sons and daughters depends upon our victory in this struggle. So those things which are essential to victory must come first. And since the production of war munitions in overwhelming volume and quality can hasten that victory and save countless lives of our fighting men, no effort that will contribute to this end should be regarded by us as a sacrifice.

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The present is no time for self-congratulation upon our achievements either in the theatres of battle or of production. The mounting casualty lists should suffice to curdle the savor of any such indulgence. The most that can be said in reasonable taste and good conscience is that performance in both fields is such as to warrant our firm confidence that we can carry to successful completion the tasks that remain to be done.

Nor is there profit in even observing, much less deploring, that the tasks ahead are more formidable than those which were defined for us a few short months ago. Then, all of us—military leaders, government officials, workers, and business men—were riding a crest of optimism as to an early end of the war in Europe and as to the character and dimension of the war against Japan. Already we had begun to turn anxiously toward the problems of reconversion which then seemed so near at hand. Schedules for war production, based upon the best available estimates of need, called for a 5 billion dollar reduction from 1944 performance, even though we might have to continue a two-theatre war, and for a 40 percent reduction in the event of an early victory in Europe.

Today, those forward estimates have been revised sharply upward. That is true both of the 1945 requirements to meet the needs of a two-theatre war, and of requirements for the Pacific war once the European phase is ended. For this upward revision four chief reasons are responsible:

1. European battle experience has shown markedly greater use of expendable munitions than was provided in the formulae upon which our original production schedules were calculated: the result has been a depletion of inventories on a scale that would become dangerous if allowed to continue.
2. Experience has also demonstrated the need for new types of weapons or increased complements of some existing types to match new enemy equipment or tactics.
3. A less easy optimism as to the early ending of the European war has given rise to a growing disinclination to gamble on the approximate date.
4. An increasing conviction prevails that the war against Japan may require ground-army operations on the Asiatic mainland on a scale greater than originally premised.

But if these changes in the fortunes and outlook of war have raised our estimates of military requirements, may not subsequent favorable changes in the military situation cause them again to be revised downward? It is entirely possible. But our military men have learned that they cannot safely discount what *might desirably happen* as something that *will happen*. Those working on the production front also must learn that lesson. Fortunately, the record shows that we have been able to maintain a war production almost equal to that of the rest of the world combined, even while we produced for civilian use on a scale that has been large even by our

own pre-war standards. So we have ample margin to whip whatever war job may be required of us. As now defined, the task will not be easy. But it *can* and *will* be done.

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What, then, is the production task with which we are charged? Our 1945 production for the two-theatre war now calls for the substantial maintenance of the over-all levels reached in the latter months of 1944. But there is a shift of emphasis. Almost half of the programs for specific equipment items are declining. A few are scheduled to hold level. About 45 percent are scheduled to rise sharply. That means that workers and facilities must be shifted to man the expanding programs. At the same time the armed services are calling for many more men than can be supplied from those who become newly eligible to the 18 year old age group. That means further drafts upon war workers. It means also replacements for them when they are taken from the expanding programs. Finally, events demand that we produce as much as possible of many items during the first half of 1945.

Our task, then, is one of intensified effort for the immediate future, with multiple readjustments at a stage when adjustments are hard to make. Materials for which demand was easing as pipe-lines were being drained in anticipation of falling schedules again are tight as the pipe-lines are being refilled to meet augmented requirements. Men, women, and facilities must be shifted from less essential to more essential tasks. What must be done will be done. But unless there is much voluntary accommodation, it will be necessary for us to suffer a formidable amount of governmental direction which none of us likes, many of us deeply resent, and all of us, when personally affected, volubly protest. The more we police ourselves, the less we shall be policed.

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Even after Germany has been defeated, we shall still face a far from light production requirement to continue the war against Japan. As currently defined this phase might require war expenditures at something like $70 billions a year, an over-all reduction of approximately 20 percent from the $89 billions spent in 1944. Reduction in munitions output would be somewhat greater, probably from 25 percent to 30 percent below 1944 levels. But it is important for us to acknowledge that the reduction is going to be substantially less than the 40 percent previously estimated.

Only a few months ago there were those who questioned sharply the possibility that we might need 60 percent of current munitions output to win the Japanese war. Now the judgment of the military is that 70 percent will be none too high.

Actually the latter level would represent an increase of little more than 50 percent above what now is being produced for the Pacific area. This, certainly, is a modest estimate when we reflect that we shall inevitably more than triple the Army forces assigned to that theatre.

Such a program probably would give us a current munitions supply from three to four times that produced by Japan, but it is believed that we shall need that much to compensate for the advantages derived by Japan from the fact that she will be fighting a defensive war, from the volume of her accumulated stores, from her prepared positions, her shorter lines of supply and transport, and from her large troop reserves, the bulk of which we have yet to meet in battle. Certainly our present 3 to 1 production edge over Germany does not appear to be excessive.

The more modest V-E Day cuts contemplated by the present plan will mean a less acute reconversion problem when they are made, but will leave a greater one to be met at the end of the war. They will mean probably a net increase of not more than 4 million workers available for civilian work during the transition period. Their orderly absorption should present no embarrassing problem. Indeed, we now are warned by Washington that war production following V-E Day may require the protection of considerably closer control than was contemplated under the 40 percent cuts previously expected.

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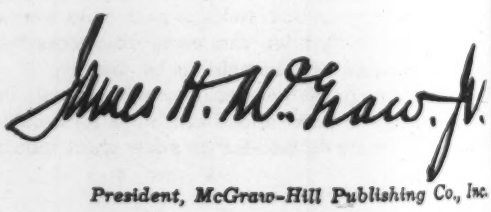
In short, we face for the immediate future a more difficult production job. It is made the more formidable by the fact that we had dulled the keen edge of our will to produce by our premature expectation of a reduction in requirements. Now we are told that the trend of war production for the immediate future is up, that it is unsafe to discount the date of victory in Europe, and that the amount of leeway for reconversion after the defeat of Germany is less than had been anticipated.

Accordingly, we must rededicate ourselves to the task of driving war production up. We must do without some of the things that we have enjoyed on the civilian front rather than demand more of those things; we have still to devote our abilities and energies first and foremost to the demands of war.

Whatever will assure and hasten victory must have first place in any statement of American policy.

Without victory, our aims, and the underlying values upon which they are based, will be extinguished, blotted out by the opposing aims and values proclaimed by our enemies.

The needs of our fighting men must be put first. For, unless we win the war, the National aims and policies of the United States will cease to have meaning in the world.



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CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

SEWERAGE SYSTEM
HOUSTON, TEX.

OWNER: Federal Works Agency, Fort Worth, Tex., and City of Houston, Tex.

PROJECT: Construction of sewage disposal plant and lift station (Contract 6), and sewage collection lines and lift station (Contract 7) in Houston, Tex., serving approximately 10,884 people. Alternates were allowed in Contract 6 for a standard filter plant, or an alternate plant with items as shown below in the tabulation. Award made on basis of alternate type filter plant. Contract 6 involves paving of driveways, walks, curbs and gutters; drainage pipes and structures; fencing; yard piping and service lines; sewage lift line; Imhoff tank; sludge drying beds and pumping plant; office and laboratory building; head box; trickling filter; clarifier; and Parshall flume. On Contract 7 alternates were allowed for vitrified clay sewer pipe, or concrete sewer pipe. Award on vitrified pipe basis.

CONDITIONS: Contractor to furnish all materials on both contracts. Completion time on Contract 6 is 180 calendar days; on Contract 7 it is 175 calendar days. Rail, highway and water transportation facilities available. Wage rates are: skilled labor $1.725 per hour; semi-skilled $1.00; and common, 60c.

BIDS: Four bids were received on Contract 6, September 20, 1944 ranging from the contract low of $193,190 to $203,400. Six bids were opened on the same date for Contract 7 ranging from the contract low of $292,076 to $421,530.

Contract 6—Sewage Disposal Plant and Lift Station

LIST OF BIDDERS: (Alternate trickling filter.)

1. Tellepsen Constr. Co., Houston, Tex. (contract) $193,190
2. Gayle Brothers, Houston, Tex 196,698
3. R. P. Farnsworth & Co., Houston, Tex 199,423
4. John G. Holland, Houston, Tex 203,400

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Conc. and gravel driveways, walks, curbs and gutters	Lump Sum	$13,300.00	$7,377.50	$11,544.00
2. Drain pipes and drainage structures	Lump Sum	5,200.00	13,282.00	6,200.00
3. Fencing, gates and flood gates	Lump Sum	4,800.00	4,828.42	5,880.00
4. Yard piping, gas lines, cast iron pipe, etc.	Lump Sum	21,560.00	7,335.00	15,953.00
5. All yard electric service lines	Lump Sum	1,300.00	1,243.00	1,495.00
6. Sewage lift line	Lump Sum	20,760.00	23,491.91	15,319.00
7. Install Imhoff tank, with pipes	Lump Sum	46,400.00	51,208.84	55,473.00
8. Sludge drying beds	Lump Sum	24,120.00	22,000.00	31,530.00
9. Sludge pumping plant	Lump Sum	3,850.00	4,596.41	3,639.00
10. Office and laboratory building	Lump Sum	10,000.00	18,665.00	13,360.00

(Above items are common to both standard and alternate filter systems)

Items for Standard Trickling Filter

Item	Quan.	Unit Prices (1)	(2)	(3)
11. Dosing plant and siphon	Lump Sum	$1,750.00	$1,039.68	$1,393.00
12. Two standard trickling filters	Lump Sum	67,300.00	62,424.80	53,225.00
13. Standard Parshall flume	Lump Sum	1,400.00	1,695.00	1,554.00
14. Standard filter recirculation tank	Lump Sum	4,700.00	4,700.00	5,059.66

Items for Alternate Trickling Filter

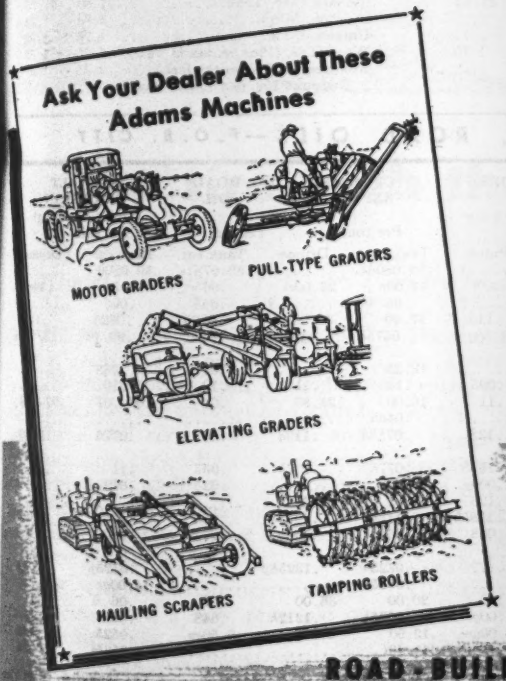
Item	Quan.	Unit Prices (1)	(2)	(3)
15. Head box, complete	Lump Sum	$300.00	$1,029.68	$439.00
16. Alternate trickling filter	Lump Sum	23,900.00	22,946.40	20,825.00
17. Clarifier (alternate)	Lump Sum	15,500.00	16,548.65	16,715.00
18. Parshall flume (the deeper throat.)	Lump Sum	2,300.00	2,195.00	1,250.00

Contract 7—Sewage Collection Lines and Lift Station

LIST OF BIDDERS: (Vitrified Clay Pipe Sewer).

1. Carey W. George Constr. Co., Mobile, Ala. (contract) .$292,076
2. C. F. Lytle Co., Sioux City, Iowa 313,616
3. Koller Constr. Co., Oklahoma City, Okla 317,711
4. R. P. Farnsworth & Co., Houston, Tex 326,952
5. Tellepsen Constr. Co., Houston, Tex 384,666
6. Knutson Constr. Co., Houston, Tex 421,530

Item	Quan.	Unit Prices (1)	(2)	(3)
1. 6-in. vit. clay pipe sewer, 0-6-ft.	9,830 l. f.	$0.82	$0.95	$1.00
2. 6-in. vit. clay pipe sewer, 6-8-ft.	300 l. f.	1.06	.90	1.00
3. 6-in. vit. clay pipe sewer, 8-10-ft.	10 l. f.	1.20	1.04	1.00
4. 8-in. vit. clay pipe sewer, 0-6-ft.	19,805 l. f.	1.04	1.22	1.00
5. 8-in. vit. clay pipe sewer, 6-8-ft.	20,335 l. f.	1.16	1.25	1.00
6. 8-in. vit. clay pipe sewer, 8-10-ft.	7,255 l. f.	1.28	1.44	1.00
7. 8-in. vit. clay pipe sewer, 10-12-ft.	6,185 l. f.	1.61	1.83	2.00
8. 8-in. vit. clay pipe sewer, 12-14-ft.	875 l. f.	2.62	1.68	2.00
9. 8-in. vit. clay pipe sewer, 14-16-ft.	850 l. f.	3.70	1.99	3.00
10. 8-in. vit. clay pipe sewer, 16-18-ft.	1,025 l. f.	4.80	2.00	3.00
11. 8-in. vit. clay pipe sewer, 18-20-ft.	10 l. f.	6.10	2.23	4.00
12. 10-in. vit. clay pipe sewer, 0-6-ft.	860 l. f.	1.30	1.62	1.50
13. 10-in. vit. clay pipe sewer, 6-8-ft.	800 l. f.	1.45	1.54	1.50
14. 10-in. vit. clay pipe sewer, 8-10-ft.	1,450 l. f.	1.62	1.65	2.00
15. 10-in. vit. clay pipe sewer, 10-12-ft.	910 l. f.	2.10	1.75	2.50
16. 10-in. vit. clay pipe sewer, 12-14-ft.	2,200 l. f.	2.24	1.85	2.70
17. 10-in. vit. clay pipe sewer, 14-16-ft.	10 l. f.	3.20	1.99	3.00
18. 10-in. vit. clay pipe sewer, 16-18-ft.	2,250 l. f.	3.92	2.20	4.50
19. 10-in. vit. clay pipe sewer, 18-20-ft.	375 l. f.	5.15	2.65	4.70
20. 10-in. vit. clay pipe sewer, 20-22-ft.	125 l. f.	7.60	2.92	5.00
21. 10-in. vit. clay pipe sewer, 22-24-ft.	10 l. f.	10.65	3.31	6.75
22. 12-in. vit. clay pipe sewer, 8-10-ft.	2,250 l. f.	1.84	3.00	2.40
23. 12-in. vit. clay pipe sewer, 10-12-ft.	260 l. f.	2.65	3.10	2.70
24. 12-in. vit. clay pipe sewer, 12-14-ft.	1,300 l. f.	2.78	2.22	3.00
25. 12-in. vit. clay pipe sewer, 14-16-ft.	1,300 l. f.	3.43	2.34	3.60
26. 12-in. vit. clay pipe sewer, 16-18-ft.	10 l. f.	6.66	2.47	4.35
27. 12-in. vit. clay pipe sewer, 18-20-ft.	10 l. f.	8.64	2.88	5.00
28. 15-in. vit. clay pipe sewer, 10-12-ft.	4,995 l. f.	3.05	2.60	3.65
29. 15-in. vit. clay pipe sewer, 12-14-ft.	2,235 l. f.	3.36	2.73	4.20
30. 15-in. vit. clay pipe sewer, 14-16-ft.	925 l. f.	3.98	2.85	4.70
31. 15-in. vit. clay pipe sewer, 16-18-ft.	425 l. f.	6.17	3.00	5.00
32. 15-in. vit. clay pipe sewer, 18-20-ft.	10 l. f.	22.23	3.30	17.00
33. 18-in. vit. clay pipe sewer, 0-6-ft.	35 l. f.	2.86	2.63	3.00
34. 18-in. vit. clay pipe sewer, 6-8-ft.	35 l. f.	3.14	2.97	3.00
35. 18-in. vit. clay pipe sewer, 8-10-ft.	2,725 l. f.	3.34	3.00	4.00
36. 18-in. vit. clay pipe sewer, 10-12-ft.	1,295 l. f.	3.86	3.20	4.50
37. 18-in. vit. clay pipe sewer, 12-14-ft.	725 l. f.	4.30	3.32	5.15
38. 18-in. vit. clay pipe sewer, 14-16-ft.	725 l. f.	4.83	3.43	5.65
39. 18-in. vit. clay pipe sewer, 16-18-ft.	725 l. f.	5.06	3.58	6.50
40. 18-in. vit. clay pipe sewer, 18-20-ft.	125 l. f.	6.68	3.80	7.30
41. 18-in. vit. clay pipe sewer, 20-22-ft.	3,020 l. f.	7.82	4.10	7.30
42. 18-in. vit. clay pipe sewer, 22-24-ft.	10 l. f.	12 31	4.63	9.00
43. 24-in. vit. clay pipe sewer, 20-22-ft.	200 l. f.	16 00	5.45	11.70
44. 24-in. vit. clay pipe sewer, 22-24-ft.	10 l. f.	21 36	5.95	15.50
45. 8-in. c. i. pipe for sewer	472 l. f.	2.80	1.59	1.80
46. 10-in. c. i. pipe for sewer	180 l. f.	3.12	2.05	1.35
47. 12-in. c. i. pipe for sewer	18 l. f.	3.79	2.65	1.80
48. 16-in. c. i. pipe for sewer	200 l. f.	4.40	4.10	2.80
49. 18-in. c. i. pipe for sewer	200 l. f.	6.16	4.96	3.70
50. 24-in. c. i. pipe for sewer	12 l. f.	10.78	7.95	6.00
51. 6-ft. standard manhole	251 ea.	75 00	122 20	100.00
52. Extra depth manhole	554 ft.	11 00	33 20	10.00
53. 6-ft. drop manholes	20 ea.	25 00	128.00	110.00
54. Extra depth manhole	165 ft.	5 00	23 20	12.00
55. Stacks, 0 to 7-ft.	231 ea.	9 00	6.50	12.50
56. Extra height stacks	701 ft.	1.20	1.32	2.00
57. 6x8-in. wyes and tees	379 ea.	2 00	1.65	1.80
58. 6x8-in. wyes and tees	1,185 ea.	3 00	3 00	2.00
59. Cleanouts, furnished	18 ea.	30.00	30.00	40.00
60. 8-in. sewer under railroad tracks	Lump Sum	960.00	530.00	500.00
61. 8-in. sewer under interurban tracks	Lump Sum	840.00	530.00	500.00
62. 8-in. sewer under railroad tracks	Lump Sum	800.00	530.00	500.00
63. 8-in. sewer under interurban tracks	Lump Sum	750.00	530.00	500.00
64. 8-in. sewer under interurban tracks	Lump Sum	900.00	570.00	500.00
65. 24-in. sewer under inter. tracks at disposal plant	Lump Sum	1,200.00	990.00	1,000.00
66. 8-in. sewer under street	Lump Sum	1,500.00	925.00	800.00
67. 8-in. sewer under street	Lump Sum	1,200.00	925.00	500.00
68. 8-in. sewer under street	Lump Sum	1,000.00	740.00	500.00
69. 8-in. sewer under street	Lump Sum	1,800.00	740.00	500.00
70. 12-in. sewer under federal road	Lump Sum	1,600.00	570.00	500.00
71. 12-in. sewer under street	Lump Sum	1,500.00	530.00	500.00
72. 18-in. sewer under street	Lump Sum	2,000.00	925.00	600.00
73. Headwall and spillway apron	Lump Sum	600.00	200.00	150.00
74. Extra earth excavation	100 c. y.	12.00	2.65	2.00
75. Concrete, 2,000-lb., in place	25 c. y.	50.00	26.50	25.00
76. Concrete, 3,000-lb., in place	20 c. y.	65.00	190.00	35.00
77. Rein. conc., 3,000-lb., in place	2 c. y.	80.00	200.00	40.00
78. Concrete reinforcing bars	2,000 lb.	.15	.065	.06
79. Timber and lumber	606 M bm.	40.00	95.00	40.00
80. Hauling supplies	100 ton-mile	1.00	1.32	1.00
81. Sewage lift plant	Lump Sum	8,532.00	12,000.00	10,000.00



A WIDE, flexible range of operating speeds—ability to provide the *right* working speed for *every* construction and maintenance job—that's one of the important time-saving, money-saving features of Adams Motor Graders. Adams 8 forward speeds permit operator to select speed best suited for every type of operation at fastest practical rate—with transport speeds up to 21 m.p.h. for fast moving from job to job.

Many outstanding advantages combine to make Adams Motor Graders your best buy—rugged strength, rigidity, balanced weight distribution, ease and economy of operation, quick adaptability to all kinds of cuts. Discuss these advantages with your local Adams dealer.

J. D. ADAMS MANUFACTURING CO.
INDIANAPOLIS, INDIANA
Sales and Service Throughout the World

ADAMS

ROAD-BUILDING AND EARTH-MOVING EQUIPMENT

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents

PORTLAND CEMENT, steel railroad rail, and wire nail prices are the major changes reported in the construction field in February. Portland cement increased 20c. per barrel in Chicago, 10c. in Pittsburgh, and 25c. in Seattle. The price decreased 1c. in Dallas.

An OPA-authorized price increase boosted the base price of standard and light railroad rails $2.00 per gross ton, and raised re-rolled rail from $39.00 per gross ton to $42.00 per net ton. Wire nails climbed from $2.55 per 100-lb. to $2.80, at the mill.

The common brick price dropped from $22.25 to $20.50 in Detroit. Lime was up $1.00 per ton in Baltimore, and sand and gravel increased 5c. per ton there. Roofing supplies rose in St. Louis.

No changes were reported in lumber, paving asphalt, structural shapes, reinforcing bars, vitrified sewer pipe, clay drain tile, concrete sewer pipe, or structural clay building tile.

Common and skilled construction labor rates were unchanged from the preceding month in the twenty reporting cities.

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F.O.B. CITY

	PORTLAND CEMENT — Per bbl., C/L lots, incl. 40c. per bbl. for bags, cash dis. not deducted			SAND AND GRAVEL — Per ton, carload lots			CRUSHED STONE — Per ton, carload lots		CRUSHED SLAG — Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.; truckload del.; per block		CONCRETE Ready Mixed 1:2:4, over 50 c.y., del.
	Cloth *a*	Paper	Bulk	1½ in.	¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand-grav.	Lt.wgt. Agg.	
Atlanta	$2.77	$2.52	$2.47	$1.79	$1.89	$1.99	$1.79	$1.89	$1.59	$1.69	$0.17	....	$8.00
Baltimore	2.62	2.37	2.12	1.80‡	1.80‡	1.30‡	1.80‡	1.80‡	1.75‡	1.75‡	.125	$0.125*w*	7.45
Birmingham	2.50	2.25	2.10	1.75	1.75	1.50	.85	1.00	.90	1.15	.1425	....	5.80
Boston	2.97*b*	2.72*b*	2.52	1.50‡	1.50‡	1.05‡	1.25‡	1.35‡	....	....	.13	.155*w*	7.55*m*
Chicago	2.90	2.65	2.50	2.15‡*d*	2.15‡*d*	2.15‡*d*	2.15‡*d*	2.15‡*d*	1.75‡	1.75‡	.16	.16*x*	....
Cincinnati	2.41	2.16	1.96	1....	1.20	1.10	1.80	1.80	....	....	.12	.15*w*	6.70
Cleveland	2 49	2.24	....	1.75*h*	1.75*i*	1.55*i*	1.80*i*	1.80*i*	1.73‡*i*	1.73‡*i*	.14	.14	7.45
Dallas	2.51	2.26	2.06	1.50*p*	1.70*p*	1.10*p*	1.69*p*	1.79*p*	....	....	.15	....	6.20
Denver	3.08	2.88	2.32	1.20	1.30	1.25	1.65	1.75	1.00	1.00	.15	....	7.25
Detroit	2.49	2.24	2.09	1.50	1.50	1.50	2.25	2.25	2.00‡	2.00‡	.13	.14*w*	7.15
Kansas City	2.58	2.33	2.18	1.85	2.30	1.00	1.91	1.91	....	....	.125	.125*wy*	7.80*n*
Los Angeles	3.20	2.60*v*	....	1.30	1.30	1.15	1.30*f*	1.30*f*	....	....	.04‡*b*	.10*aa*	7.25
Minneapolis	2.90	2.65	....	1.00*h*	1.00*h*	.25*h*	1.00*h*	1.00*h*	....	....	.12	.16	7.35*j*
Montreal	....	1.95*rs*	1.79*rs*	1.65‡*s*	1.65‡*s*	1.50*t*	.80*ct*	.90*ct*	....	....	.14*t*	.14*wt*	7.85*u*
New Orleans	2.42	2.16	1.96	1.67	1.65	1.22	....	....	.90	1.15	.19	....	9.25
New York	2.85‡	2.60‡	....	1.60‡*de*	1.60‡*de*	.90‡*de*	1.70‡*de*	1.80‡*de*	....	....	.16	.14*wcc*	7.50*k*
Philadelphia	2.73	2.48	2.28	1.55‡	1.65‡	1.20‡	1.90	1.95	1.10	1.10	.155	.155*w*	8.45
Pittsburgh	2.65	2.40	2.20	1.65‡	1.65‡	1.85‡	2.25‡	2.25‡	1.50	1.50	.17	.17*z*	8.40
St. Louis	2.80	2.52	....	1.75‡	1.75‡	1.25/1.50‡	1.10*h*	1.10*h*	.90*g*	.90*g*	.145	.13*w*	8.00
San Francisco	2.21	2.01	1.71	1.36	1.36	1.36	1.46	1.46	....	....	....	.21*y*	7.35
Seattle	....*u*	3.00*o*	....	1.00*o*	1.00*o*	1.00*o*	2.00*o*	2.00*o*	....	....	.16	.16*y*	7.25

‡ Delivered. *a* 10c. allowed for each returnable bag. *b* 10c. per bbl. off for cash. *c* F.o.b. quarry. *d* Per cu. yd. *e* Barge lots alongside docks. *f* Crushed granite. *g* F.o.b. Granite City, Ill. *h* F.o.b. plant. *i* Within three miles of Public Square. *j* 5% discount for cash. *k* Discount of 2 percent for cash in 10 days. *l* Up to 200 cu. yd. *m* 50c. off for cash. *n* 25 c.y. or more. *o* 2% off for cash. *p* 10c. per ton off, cash 15 days. *r* 10c. per bbl. off, cash 20 days. *s* 8% sales tax included. *t* 8% sales tax not included. *u* Withdrawn. *v* 20c. per bbl. discount; 20c. allowed for returnable cloth bag. *w* Cinder. *x* Waylite. *y* Haydite. *z* Celocrete. *aa* Pumice. *bb* 4 x 8 x 12 in. *cc* Also 8 x 18 x 18 in.

CASH DISCOUNTS CEMENT to Contractors: truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICE BASES AT CEMENT MILL

Charge for bags not included. For cloth bags, add 40c. per bbl.; 10c. refund allowed for each returnable bag; for paper bags add 15c. per bbl., not refundable.

	Bagged	Bulk
Buffington, Ind.	$1.70	$1.65
Dallas, Tex.	....	....
Hannibal, Mo.	1.70	1.65
Hudson, N. Y.	....	....
Independence, Kans.	1.70	1.65
Ironton, Ohio	$1.70	$1.65
Limedale, Ind.	....	....
Norfolk, Va.	....	....
Northampton, Pa.	1.75	1.70
North Birmingham, Ala.	....	....
Richard City, Tenn.	$1.80	$1.75
Steelton, Minn.	1.80	1.75
Universal, Pa.	1.75	1.70
Waco, Tex. (Plus 9c. tax in Tex.)	1.75	1.70
Montreal (8% sales tax incl.) Discount 10c. per bbl. 20 days	1.68	1.67

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F.O.B. CITY

	PAVING BRICK AND BLOCK — Granite per M. lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	PAVING ASPHALT — Per ton, less than 80 penetration Tank car	Drums	ASPHALT BINDERS—FLUXES — Per gal., 80–300 penetration Tank car	Drums	CUTBACK ASPHALT — Per ton Tank car	Drums	ROAD OIL — Per gal. Tank car	ASPHALT EMULSION (Quick-breaking) Per gal. Tank car	Drums
Atlanta	$73.00	$39.35	$2.25	$18.53*e*	.....†	$0.0740*e*	.....†	$0.0806*he*	.....†	$0.0781*e*	$0.0806	.....†
Baltimore	150.00‡	49.00	85.00*m*	15.00*r*	21.00*r*	.06*r*	.09*r*	13.00*r*	23.00*r*	.065*r*	.07*r*	.14*r*
Birmingham	150.00	48.00	.....	17.95	.....†	.0747	.....†	.0834*h*	.....†	.065	.095	.....†
Boston	85.00	59.00	3.75	15.00	24.00	.0625	.115	17.00	30.00	.0625	.0825	.145
Chicago	150.00	55.00	2.50/2.80*d*	14.00	22.50	13.00*g*	21.50*g*	.0575*h*	.15*h*	.05*n*	.09/10*n*	.13/.15*n*
Cincinnati	120.00	53.75	.....	17.00	.....	.085	.....	12.25	.....	.07	.085	.....
Cleveland	120.00	37.25	2.50	17.00	19.00	.085	.095	.10*h*	.11	.10	.10	.....
Dallas	.....	36.00	.....	13.65	20.30	.06	.11	16.00	24.80	.06	.05/.07	.07/.09
Denver	.....	16.11	.....	11.00	.....	10.00	.....	.045*h*	.....	.....	.....	.....
Detroit	.....	37.00	.....	18.06*f*	25.60*f*	.0743	.128	.0718*h*	.119*h*	.067	.0775	.1149
Kansas City	.....	44.00	.....	18.50	23.50	.077	.1075	.077*h*	.107*h*	.057	.11	.15
Los Angeles	.....	50.00	.....	9.00*b*	23.00	9.50*bg*	24.00*bg*	9.50*b*	.....	.025	.072	.15
Minneapolis	.....	.....	2.30*d*	.....	27.70	.....	.126	.....	32.64	.....	.....	.....
Montreal	92.40	.....	.....	16.60*k*	24.25*k*	.116*k*	.1485*k*	.115*hk*	.135*hk*	.08*k*	.135*k*	.188*k*
New Orleans	.....	.....	.....	13.50*a*	20.00*a*	.057	.088	.06*h*	.095*h*	.....	.080	.....
New York	.....	65.00	.....	17.40	24.20*p*	14.00	.....	.0725*h*	.1325*hp*	.....	.0725*p*	.119*p*
Philadelphia	140.00	58.00	4.06	15.00*r*	.....	14.00*r*	.....	.0625*h*	.....	.....	14.00*gr*	.....
Pittsburgh	135.00	38.75	.....	18.00	23.00	.09	.16	20.00	36.00	.07	.06	.11
St. Louis	.....	39.00	.....	16.00	22.00	15.00*g*	21.00*g*	.0575*h*	.1212*h*	.648	.06	.11
San Francisco	.....	45.00	.....	10.90	21.15	10.90*g*	18.00*gr*	12.90	17.50*r*	9.50*gr*	.0525	.1125
Seattle	.....	....	.....	10.90*i*	23.40*i*	.....	20.40*gi*	11.40*i*	.....	.....	.0525*i*	.0625

‡ Delivered. *a* F.o.b. Baton Rouge. *b* Delivered to purchaser's warehouse. *e* 3½x4x8½ in. *d* 2½ in. 12-lb. treatment. *e* Local reduction due to 20% reduction intra-state class freight rates, only Georgia affected. *f* Mexican. *g* Per ton. *h* Per gallon. *i* F.o.b. Martinez. *j* 3x3½x8½ in. *k* Tax included. *m* Per thousand. † Available on priority only and quoted specially. *p* No steel drum shipments except to armed forces. *r* February 1943 prices, none later available.

The tire with the built-in rock absorber

A typical example of B. F. Goodrich development in rubber

WHEN one of these big tires hits a rock, it's a piledriver blow, a sharp impact with tons behind it. And rocks just can't always be avoided in off-the-road service. Big four and five-foot tires are costly (the rear tires in the picture cost $650 apiece). Often, under impact, these tires bruised, blew out. This meant expensive delays, repairs, or discarding the tire.

B. F. Goodrich engineers set to work, developed a new principle of tire construction, put a "rock absorber" or *shock shield* under the tread to provide greater protection against separation, bruising and blow-outs. The shock shield is a set of four breakers, layers of rubber-coated rayon cord fabric, insulated with cushions of special shock-resisting rubber.

Under impact the cords in these breakers stretch together—not across each other—and return to their original position, distributing the force of the blow and allowing it to be absorbed by the rubber between them. Thus the shock passed on to the cord body of the tire is greatly reduced.

Users say their records show B. F. Goodrich tires built this way often last twice as long. Repair bills are cut. Delays reduced.

This development is typical of those going on constantly at B. F. Goodrich.

We urge every user of off-the-road equipment to try B. F. Goodrich tires alongside of other makes. Keep accurate service records. Compare natural rubber tires with natural rubber, synthetic with synthetic, and prove to yourself that you can save money with B. F. Goodrich tires.

Supplies of most sizes of off-the-road tires are strictly limited. It is well to place tentative orders early. See the local B. F. Goodrich dealer for information, or write us direct. The B. F. Goodrich Co., Akron, Ohio.

B.F. Goodrich
Truck & Bus Tires

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-PLATE	REINF. BARS ¼-in. billet *b*	RIVETS ½-in. structural	WIRE NAILS Base *d*	SHEET PILING Base	STEEL RAILS Per Gross Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle Bars	Std. Spikes *c*	Tie Plates *c*	Track Bolts
Birmingham	$2.10	$2.15	$3.75	$2.80	.....	$43.00	$43.00	$43.00*	$2.70	$3.00	$2.15	$4.75
Chicago	2.10	2.15	3.75	2.80	$2.40	43.00	43.00	43.00*	2.70	3.00	2.15	4.75
Pittsburgh	2.10	2.15	3.75	2.80	2.40	43.00	43.00	43.00*	2.70	3.00	2.15	4.75
Buffalo	2.10	2.15	.....	.....	2.40	.....	.....	.....	.....	.....	2.15	.....
Cleveland	2.10	2.15	3.75	2.80	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown	.....	2.15	.....	.....	.....	.....	.....	.....	.....	3.00	.....	.....
Detroit	.....	2.27‡	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gulf ports	2.47*a*	2.52*a*	.....	.....	2.85*a*	.....	.....	.....	.....	.....	.....	.....
Pacific ports	2.75*a*	2.80*a*	.....	3.30	2.95*a*	.....	.....	.....	.....	.....	2.30	.....

‡ Delivered. *a* F.o.b. cars dock. *b* Rail steel same as billet prices. *c* Other basing points include Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone, Steelton, Pa., on spikes alone, Lebanon, Pa., Richmond, Va. *d* Add switching charge $18 per cl. * Per net ton

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRICE

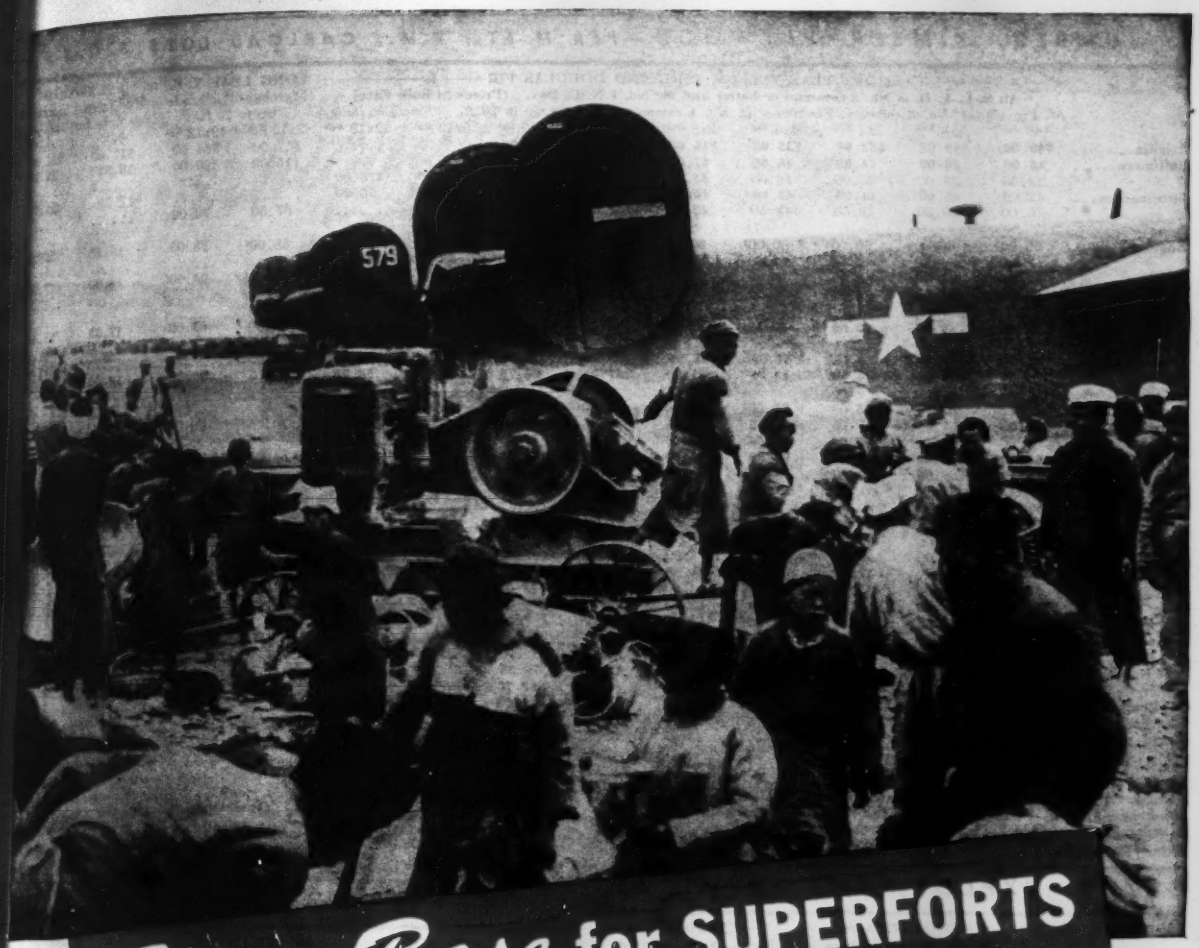
	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS* Per 100 lb., ¾ in., base price 15 tons or over *b* New billet	Rail steel	Add Switch	$/cwt. for Del.	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq. ft., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in. No. 6 & 6 wires *k* Per 100 s. f.	SHEET PILING Per 100 lb. base price
Atlanta	$2.34	$2.40	$2.40	$.02½	$.10	$21.06	$23.00	$1.82	$1.35	$1.91	$3.04
Baltimore	3.70	2.90	2.75	.....	.10	22.50	24.50	1.70	1.27	1.79	3.00
Birmingham	2.10*a*	2.15	2.15	.02½	.10	19.00	21.00	1.80	1.34	1.89	....
Boston	3.912	3.994	....	$20 C.L.	.10	18.50	29.50	1.76	1.31	1.84	2.77
Chicago	2.10*a*	2.15	2.15	.03	.05	21.50	23.50	1.67	1.25	1.75	2.40
Cincinnati	3.68	2.53*cd*	2.53*cd*	.....	.05	19.50	21.50	1.66	1.25	1.74	....
Cleveland	2.10*a*	2.15	2.15	.02½	.10	19.50	21.00	1.66	1.25	1.74	....
Dallas	4.25	3.17	3.17	.....	....	25.00	27.50	1.93	1.42	2.03	....
Denver	4.57	3.33*k*	....	.....	....	26.50	26.50	1.97	1.45	2.07	....
Detroit	3.661‡	2.50‡	2.50‡	.....	.10	30.00	30.00	1.68	1.26	1.76	2.66
Kansas City	4.19	2.61*cd*	2.61*cd*	.0	.05	24.50	26.50	1.78	1.33	1.87	2.874
Los Angeles	3.65*f*	2.575	2.425	.02½	.05	23.00	27.50	1.93	1.42	2.03	3.65
Minneapolis	3.81‡	2.73	2.73	.0	.10	25.00	27.00	1.80	1.34	1.89	2.73*d*
Montreal	3.95*i*	2.90*i*	2.80*i*	.....	....	31.00*hi*	46.00*hi*	2.76	3.44*i*	.282*im*	....
New Orleans	4.229‡*k*	2.52	2.52	.05	.10	19.00	21.00	1.82	1.35	1.91	2.875
New York	3.75	2.76*c*	2.76*c*	.....	.15	17.50	19.50	1.76	1.32	1.81	2.74
Philadelphia	3.666	3.668	....	.....	....	19.50	21.50	1.71	1.28	1.79	2.72
Pittsburgh	2.10*a*	2.15	2.15	.02½	.10	23.00	26.50	1.50	1.20	1.67	2.40
St. Louis	3.697	2.74	2.74	.0	.05	28.00	34.00	1.69	1.27	1.78	2.70
San Francisco	4.35	2.825	2.675	.02½	.10	21.00	24.50	1.93	1.42	2.03	3.70
Seattle	2.75*e*	2.80*e*	....	.....	....	34.50	38.50	1.93	1.42	2.03	2.95*e*

‡ Delivered. *a* Mill prices. *b* 5–15 tons, add 15c. 1–5 tons, add 25c. Less than 1 ton, add 50c. *c* 20 tons or over Base. *d* Mill price plus freight. *e* F.o.b. dock. *f* Includes delivery in free delivery zone. *g* Less than 1 ton, add 25c.; 1 to 5 tons, add 10c. * High scrap steel prices cut former 15c. differences between new billet and rail steel in many mills. *h* List price. *i* Plus Dominion and Province sales tax. *k* Quotation on changed basis; no actual price change. *m* per. sq. yd.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in.*a*	VITRIFIED SEWER PIPE Per foot, std. 8 in., s.s.	Delivered std. 12 in., s.s.	ASTM 24 in.,	C13–35 36 in.	CLAY DRAIN TILE Per 1,000 ft., car load lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered; ASTM 12 in.	C 14–35 24 in.	WROUGHT STEEL PIPE Full standard weight, *h* 1 to 3 in., Butt Weld Black %	Galv. %	3½ to 6 in.; Lap Weld Black %	Galv. %
Atlanta	$49.66	$0.265	$0.468*bc*	$1.8525*c*	$4.68*c*	$85.00	$128.00	$0.45	$1.642	48.2	34.2	39.7	5%2
Baltimore	53.00	.35	.60	2.70	7.25	160.00	200.00	.60	1.85	65.5	57.5	63.0	51..5
Birmingham	45.00	.275	.495	1.95	5.50	100.00	220.00	.50	1.70	62.2	54.2	59.7	541.2
Boston	55.40	.371*r*	.7155*r*	2.79*r*	7.6875*r*	170.00‡*r*	265.00‡*r*	.60	1.95	....	....	....	....
Chicago	54.33	.35	.675	2.70	7.00	100.00‡	150.00‡	.45	1.85	66.0	55.0	64.5	53.0
Cincinnati	53.27	.231	.4455	1.80	5.125	105.00‡*s*	170.00‡*s*	.75*t*	1.75*t*	57.1	43.4	54.0	39.6
Cleveland	54.75	.266*r*	.513*r*	2.115*r*	5.535*r*	90.60	139.40	.36	1.38	68.5	57.5	66.0	54.5
Dallas	56.43	.31	.58	2.25	5.00	90.00	110.00	.46	1.57	59.9	51.9	57.3	48.3
Denver	61.56	.29†	.52†	2.16†	3.00*n*	125.00	200.00	1.00	2.22	58.4	50.4	55.7	47.2
Detroit	54.75	.385	.7425	2.925	7.75	170.00*u*	260.00*u*	.36	1.75	57.6	44.0	54.5	40.2
Kansas City	55.73	.35	.59	2.20	6.20	140.00	260.00	.45	1.60	35.9	46.4	46.6	59.9
Los Angeles	68.40	.325†	.585†	2.70†	6.75†	130.50	217.50	1.00	2.00	61.1	50.1	58.6	47.1
Minneapolis	59.10	.305†	.549†	2.196†	6.25†	.....	.....	.90	2.10	64.2	53.2	60.7	49.2
Montreal	67.00	.85*o*	1.50*o*	5.25*p*	8.50*ep*	45.00*m*	64.00*m*	.48*m*†	1.92*m*†	....	....	....	....
New Orleans	51.78	.37*r*	.78	1.69	....	150.00	220.00	.45	1.65	62.4	54.4	58.8	50.3
New York	52.40	.308	.594	2.52	6.45	.....	.....	.60	1.40	64.9	53.9	62.4	50.9
Philadelphia	51.00	.35	.675	2.75	7.50	165.00	225.00	.45	1.75	56.6	42.8	53.6	39.1
Pittsburgh	56.00	.266†	.513†	2.295†	5.945	97.80	154.20	.85*g*	2.00*g*	68.5*i*	57.5*i*	66.0*i*	54.5*i*
St. Louis	53.62	.32	.576	2.304	6.00	100 00	260.00	1.00*j*	2.15*k*	56.4	42.6	52.5	38.4
San Francisco	68.40	.3625*d*	.6525*d*	2.61	6.52	115.00	192.50	.58	2.34	45.0	31.0	41.0	26.0
Seattle	70.20	.40	.72	2.88	7.20	115.20	.....	.51*f*	1.44*f*	....	....	....	....

‡ Delivered. † F.o.b. *a* B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. (base) $49.00. Based on existing freight rates; subject to rate change. Gas pipe and class A, $3 per ton additional, 4 in., $3 per ton additional, 30 in. and larger usually $2 per ton less. *b* Double strength. *c* List to dealer. *d* List. *e* 30-inch. *f* Less 5% for cash. *g* Culvert pipe. *h* Discounts from standard list consumers carload prices, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ½ in., 8½c.; ¾ in., 11½c.; 1 in., 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 76½c.; 4 in., $1.09; 6 in., $1.92 3 per cent tax on transportation costs not included. *i* Applies also at Lorain, Ohio, mills. Chicago delivered base is 2½ points less on butt, 1½ on lap. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from point producing lowest price at destination. WROUGHT IRON PIPE: Base price and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh base. Butt-weld—1 in. and 1¼ in. black 34, galv. 16; 1½ in. black 38, galv. 18½; 2 in. black 37½, galv. 18. Lapweld—2½ in. to 3½ in. black 31½, galv. 14½; 4½ in. to 8 in. black, 32½ galv. 17. *j* Reinforced; spec. C 76–37. *k* Reinforced; spec. C 75–37. *l* Plus sales tax. *m* Tax included. *n* 27-in. pipe. *o* Less 50%. *p* Less 53%. *r* Truck delivery. *s* Price quotations on delivered basis since Mar. 1940; current f.o.b. price $84 for 6 in.; $130 for 8 in. *t* Reinforced pipe prices since May, 1937; current plain pipe prices are: 12 in., 36c.; 24 in., $1.50. *u* Scarce: carload quantities not readily available.



Home Base for SUPERFORTS

C-87 Transport Planes Shown in Background
—Press Association Photo

B-29 Superfortresses are hitting Japan hard and often these days, from bases deep in western China and islands of the Pacific.

Here is such a base in actual construction. An International Engine powers the rock crusher, as Chinese peasant workmen bring river-bed stone for the foundation of the field.

Here East meets West. Peasant hand-labor joins forces with a modern International power plant, made at our Milwaukee, Wis., Works. This combination is one of many that is speeding the day of Victory.

International Power is world-wide power. Geographically, International Tractors and Engines span the globe. They serve every branch of the Armed Forces—efficiently, dependably.

A big share of Harvester's total production of tractors and engines continues to go to war. Meanwhile, if you own International equipment, you're fortunate. It is quality-built in the first place, plus the added advantage of being backed by a nationwide International Industrial Distributor organization. There's an International Distributor near you who is ready, willing and able to help you keep your equipment on the job.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

HARVESTER

INTERNATIONAL HARVESTER
Power for Victory . . . Power for Peace

LUMBER, TIMBER PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR — All S. L. Y. P. is No. 2 common or better end for No. 1 N. C. Box. (Prices in Bold Face) — All Fir planks No. 2 common, Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italics)								LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base price)	
	1x6 [a,g]	1x8 [a,g]	2x4 [a,g]	2x6 [a,g]	2x8 [a,g]	2x10 [a,g]	3x12 [n,h]	6x12 [n,h]	12x12 [n,h]	2x12 [n,h]	12x12 [n,h]	⅝"	¾"
Atlanta	$40.00	$40.00	$32.00	$35.00	$34.00	$37.00	$46.00	.....	.....	$57.00	$64.00	$17.90	$21.85
Baltimore	44.00	46.00	44.00	46.00	47.00	52.00	65.00	.....	.....	115.00	120.00	18.25	22.25
	48.00	*49.00*	*55.00*	*55.00*	*55.00*	*57.50*	*68.00*	*$75.00*	*$75.00*	.....	.....	.....	.....
Birmingham	45.00	45.00	44.50	43.50	44.50	47.50	68.00	55.00	56.00	.....	.....	17.35	21.15
	50.00	50.00	49.50	48.50	49.50	52.50	72.00	.....	.....	67.50	70.00	.....	.....
Boston	60.00[i]	60.00[i]	60.00[i]	60.00[i]	60.00[i]	62.00[i]	66.00[i]	.....	.....	58.00[i]	58.00	18.25	22.25
	55.00	*55.00*	*54.00*	*54.00*	*54.00*	*54.00*	*58.00*	*58.00*	*58.00*	.....	.....	.....	.....
Chicago	54.00	54.00	55.00	54.00	54.00	60.00	68.00	.....	.....	80.00[l]	95.00[l]	14.60	17.80
	55.00	*55.00*	*54.00*	*54.00*	*54.00*	*55.00*	*56.00*	*56.00*	*57.00*	.....	.....	.....	.....
Cincinnati	47.50	49.00	42.50	42.50	42.50	44.50	67.00	.....	.....	65.00	65.00	17.35	21.15
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland	42.50[k]	42.50[k]	52.50[k]	51.00[k]	55.00	55.00	83.00	83.00	83.00	.....	.....	17.75	21.60
Dallas[e]	45.25	45.25	44.50	43.00	43.00	47.25	60.75	58.75	58.75	88.75	85.00	14.60	17.80
Denver[‡]	63.50[i]	62.00[i]	65.00[i]	65.00[i]	65.00[i]	66.00[i]	69.00[i]	*83.00*	*89.00*	.....	.....	10.45	12.70
Detroit	61.00	61.00	57.75	57.75	57.75	63.75	71.00	.....	90.00	70.75	90.00	17.35	21.15
	67.00	*67.00*	*67.00*	*67.00*	*62.75*	*72.75*	*75.00*	*75.00*	*90.00*	.....	.....	.....	.....
Kansas City[a]	69.00	69.00	67.00	65.50	67.00	69.00	84.00	.....	.....	84.00	94.00	12.60	15.40
	66.00	*66.00*	*59.50*	*59.50*	*59.50*	*59.50*	*75.00*	*80.00*	*80.00*	.....	.....	.....	.....
Los Angeles[a]	*60.00*	*60.00*	*60.50*	*60.75*	*59.25*	*59.25*	*72.75*	*72.00*	*72.00*	.....	.....	9.90[gh]	12.05[gh]
Minneapolis[‡b]	59.00[i]	59.00[i]	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.60	15.40
[‡]	*58.00*	*58.00*	*57.00*	*57.25*	*56.25*	*57.00*	*64.75*	*63.50*	*63.50*	.....	.....	.....	.....
Montreal[†f]	*58.00*	*61.00*	*54.00*	*58.00*	*60.00*	*66.00*	.....	.....	.....	200.00	200.00	.....	.....
	54.00	*54.00*	*57.00*	*57.00*	*57.00*	*58.75*	*62.00*	*62.00*	*62.00*	.....	.....	.....	.....
New Orleans	40.00	40.00	37.00	35.00	34.00	36.00	46.00	.....	.....	55.00	69.00	14.60	17.80
	51.00	*51.00*	*33.00*	*31.00*	*34.00*	*32.00*	*33.00*	.....	.....	.....	.....	.....	.....
New York	67.50	67.50	62.50	62.50	62.50	64.00	74.00	.....	.....	120.00[f]	125.00[f]	18.35	22.35
[‡]	.....	.....	*65.00[i]*	*65.00[i]*	*65.00[i]*	*65.00[i]*	[Range from $75 to $95]			.....	.....	.....	.....
Philadelphia	75.00	75.00	75.00	75.00	75.00	75.00	75.00	.....	.....	130.00	130.00	18.25	22.25
	75.00	*75.00*	*75.00*	*75.00*	*75.00*	*75.00*	*85.00*	*90.00*	*90.00*	.....	.....	.....	.....
Pittsburgh	50.80	53.20	62.75	55.00	60.85	62.50	76.25	.....	.....	.....	.....	18.10	22.05
	60.20	*68.10*	*66.10*	*65.30*	*65.20*	*65.85*	*82.75*	*83.75*	*83.75*	.....	.....	.....	.....
St. Louis[‡c]	61.00	61.00	57.00	56.00	57.00	59.00	71.00	*75.00*	*75.00*	87.00	87.00	14.60	17.80
San Francisco[d]	*41.00*	*41.00*	*36.50*	*36.75*	*35.75*	*35.75*	*37.50*	*36.00*	*36.00*	.....	.....	7.30[g]	8.90[g]
Seattle	*45.50*	*45.50*	*44.50*	*44.50*	*43.25*	*43.25*	*43.50*	*43.00*	*41.75*	.....	.....	0.00	0.00

Bold Face type, Southern Pine. *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers, N. C. Pine. [3] Spruce. [4] Native. [5] Western Pine, No. 3 Common. [6] Spruce. [7] Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors discount in Minneapolis and St. Paul discontinued May 21, 1938. *c* 5M ft. or less. *d* F.o.b. cars San Francisco freight rate. *e* 10% discount taken off. *f* Up to 18 ft. † Plus sales tax.

Note: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ⅝", $95.15; on ¾", $104.85; price includes oiling and sealing charges. For other centers add rail freight increment from table or proper size. For resin dipped treatment, add $10.50 per M. *g* Lower rate by water shipment. *h* 50,000 lb. minimum. *i* Ranges from $65 to $69. *j* Average price. *k* August 1943 price. *l* September price; none later available.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS — Discounts from jobbers list, Aug. 15, 1938 Single or Double Thickness		EXPLOSIVES — Per lb. 40% Ammonia Gelatin in 50-lb. cases delivered in 200 lb. lots*
	A quality	B quality	
Atlanta	75%	75%	$0.15
Baltimore	78%	79%	.15
Birmingham	76%	76%	.105
Boston	77%	78%	.15
Chicago	77%	77%	.15
Cincinnati	77–10%	77–10%	.15
Cleveland	77%	77%	.19
Dallas	76%	76%	.1625
Denver	76%	76%	.155*e*
Detroit	77%	77%	.1575
Kansas City	77–10%	77–10%	.155
Los Angeles	86%*d*	88%*d*	.1575
Minneapolis	77%	77%	.155
Montreal	40–5%*ab*	47%*ac*	.1675†
New Orleans	70%	75%	.16
New York	81%	82%	.22*f*
Philadelphia	78%	79%	.15
Pittsburgh	79%	79%	.1225
St. Louis	77–10%	77–10%	.155
San Francisco	66%	73%	.155
Seattle	75%	75%	.1575†

Price of 60% Ammonia Gelatin in $0.01 per lb. higher than 40%

a Discount from list Sept. 1939; sales tax included, but 6% tax exemption not allowed for. *b* Single thickness. *c* Double thickness. *d* Discount from jobbers' list Sept. 15, 1928.

* Urban prices influenced by service charges or local storage and delivery regulations, do not consistently reflect quantity prices in less congested areas. *e* F.o.b. Louviers, Colo. *f* In boroughs of Kings, Queens and Richmond, and in Manhattan south of Canal St. add delivery charge of $6.00 per trip. † F.o.b.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me	$0.105	$0.13	$0.15
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.11 –.1175	.135 –.1475	.155 –.1675
Rocky Mtn. States	.11 –.1225	.135 –.1525‡	.155 –.1725‡
Pacific N. W. States	.1075–.12	.1375–.15	.1575–.17
Pacific S. W. States	.1050–.1125	.135–.1425	.155–.1625

‡ F.o.b. Louviers, Colo., or Butte, Mont.

PILES, TIES—F.O.B.

PILES

Prices per linear foot, fir and pine, bark on, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail — Pine*	By Rail — Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.34	....
12 in.— 2 ft. from butt	6-in.	50 to 59-ft.	.35	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.36	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	.515
13-in.— 3-ft. from butt	5-in.	91 to 100-ft.	....	.5825
14-in.— 2-ft. from butt	6-in.	50 to 69-ft.	.41	.62
14-in.— 2-ft. from butt	6-in.	70 to 79-ft.	.43	.59
14-in.— 2-ft. from butt	5-in.	80 to 85-ft.	.53	....
14-in.— 2-ft. from butt	5-in.	85 to 89-ft.	.56	....
14-in.— 2-ft. from butt	5-in.	90 to 100-ft.	....	.61

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b., per tie for carload lots:		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak	$1.50	....	$2.00	....
	Pine	2.00	$3.00*a*	2.50	$3.00*a*
New York	S. L. Sap Pine	1.43/1.54	2.59	1.76	2.86
	Mixed Oak	1.71	2.59	2.42	3.38
Birmingham	White Oak	1.00	1.60*a*	....	2.25*a*
Chicago	Red Oak	....	2.00/2.25*a*	....	2.87/3.00
Los Angeles	Douglas Fir	2.00	3.25*a*	2.90	4.70*a*
Philadelphia	Red Oak	....	2.10*ag*	....	3.25*ag*
St. Louis	White Oak	1.63	....	2.19	....
	Red Oak	1.63	2.20*a*	2.19	3.04*a*
	Sap Pine or Cypress	1.70	....	2.06	....
San Francisco	Douglas Fir	1.25*bef*	....	....	3.00*ef*
Montreal	Birch or Maple	.85	.90	....†	....†

Tr.— Treated: Untr.— Untreated. *a* Creosoted. *b* 6"x8"x8'6". *c* Empty cell. *d* Zinc. *e* Green. *f* F.o.b. cars. † Out of market. *g* January 1943 price, none later available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb.	$2.50– 3.10
Chlorine cylinders, liquid, per lb., delivered	.0525
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, del'd, ton	18.50–35.00
Silicate of soda, 52 deg. in drums, f.o.b. works, per 100 lb.	1.40
Soda ash, 58%, in paper bags, per 100 lb. dense	1.15
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	23.00–25.00
Sulphate of copper, in bbl., per 100-lb.	5.00

. . . with Aggregate from the Cedarapids Morok . . .

BUILD BETTER *Superhighways*

High cost of materials no longer is a vital factor influencing the construction of the superhighways that will keep the nation's roads far ahead of traffic needs. Iowa has developed a complete line of equipment that achieves large volume production at lowest possible cost by skillfully taking advantage of all the factors influencing maximum and uniform production.

The Cedarapids Morok plant, for example, is an all-portable, super quarry crushing plant that handles material in a continuous flow from quarried rock to delivery trucks in one operation. The big primary will take any rock that will pass through the bottom of a 1¼-yard shovel. Production averages 150 to 200 tons of crushed rock per hour. The plant can be easily moved to and from quarry locations as jobs change. Your only competition will be another Morok owner.

If your aggregate producing or asphalt mixing equipment is not ready for coming postwar construction jobs, now is the time for you to improve your bidding position for production and profits. We invite you to investigate Cedarapids equipment.

IOWA MANUFACTURING COMPANY
CEDAR RAPIDS, IOWA

Cedarapids — Built by IOWA

THE IOWA LINE *of Material Handling Equipment Includes*

AND GRAVEL CRUSHERS
CONVEYORS—STEEL BINS
TOR AND REVOLVING SCREENS

BUCKET ELEVATORS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS — TRAPS

PORTABLE POWER CONVEYORS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS

PORTABLE STONE PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity. Common backing	Straight hard	LIME Per ton, Hydrated finishing	In paper, Common hydrated	Carload lots, Pulverized, or lump
Atlanta	$104.00	$114.00	$199.00	$234.00	$244.00	$250.00	$17.00	$20.04	$26.54	$15.04	$15.04
Baltimore	84.00	90.00	170.00	200.00	260.00	300.00	16.00*k*	20.00*k*	19.00	14.00	2.80*m*
Birmingham	80.00	85.00	160.00	191.00	252.00	288.00	14.50	17.00	18.11	13.64	2.25*n*
Boston	103.75*a*	110.65*a*	207.45*a*	248.90	.....	.....	20.00*i*	20.00*i*	21.00*t*	.....	16.00
Chicago	79.50	85.00	160.00	197.00	243.00	278.00	15.00	16.00	17.00	15.00	12.50
Cincinnati	65.55	69.90	131.20	148.70	210.35	240.45	25.75	25.75	15.50	13.00	.....
Cleveland	71.25	76.20	125.50	150.60	201.90	231.15	20.00	20.00	15.75*j*	13.25*j*	3.30*m*
Dallas	67.90	73.25	145.80	174.96	227.62	281.72	15.25*i*	16.75*i*	19.00	15.00	15.00
Denver	84.80	95.40	153.70	178.20	212.00	227.90	14.50	18.00	25.00*j*	17.00*j*	20.00*j*
Detroit	92.70	96.70	181.20	206.75	267.50	306.00	20.50	20.50	18.00	16.00	16.00
Kansas City	67.00	69.00	89.00*e*	128.00	163.00	189.00	17.00	18.00	19.32	13.00	10.92
Los Angeles	73.50†*r*	89.50†*r*	128.00c†*r*	210.00†*r*	368.00†*r*	460.00†*r*	13.50	15.00	16.50	17.50	17.50
Minneapolis	87.00*b*	92.80*b*	157.30*b*	.....	189.00*b*	262.00*b*	25.50	27.50*g*	21.00	16.00	19.00
Montreal	94.55*a*	100.45*a*	199.50*a*	160.45*a*	109.40*at*	137.40*av*	21.08†*u*	28.35†*u*	24.60*u*	18.00*u*	20.00*u*
New Orleans	72.00	72.00	135.00	162.00	210.00	260.00	14.00	.....	18.30	12.08	14.10
New York	90.80	96.80	133.10*e*	219.80*h*	269.80*h*	333.90*h*	17.50/18.50	.....	20.00	14.00	17.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	17.00	20.00	19.00	16.00	15.00
Pittsburgh	72.85	78.55	147.25	163.75	217.50	231.00	20.50	22.50	17.90	15.40	2.55*m*
St. Louis	67.00	72.00	130.00	190.00	244.00	290.00†	20.50	19.50	22.00	18.00	2.50*m*
San Francisco	96.00	108.00	144.00	108.00*t*	.....	.....	21.50	.....	24.00	23.00	2.30*m*
Seattle	115.00	125.00	230.00	.....	.....	.....	20.50*f*	24.00*f*	20.00*s*	20.00*s*	20.00*s*

† F.o.b. *a* Smooth. *b* Carload lots delivered to job. *c* 6x12x12 in. *d* Not load bearing. *e* 48 lb. tile. *f* Less $1.00, ½ cash 15 days, balance 30 days *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* F.o.b. Warehouse only. *j* LCL. *k* $1.00 discount if paid in 10 days. *l* Lump. *m* Per bbl., 180 lb. *o* Per bbl., 200 lb. *p* 280 lb. bag. *r* 5% discount 10 days. *s* 2% discount for cash. *t* 5½x8x12. *u* 8% sales tax included. *v* 6x12x12-in. *w* Per 220 lb. bag. *x* Sept. 1944 prices, Oct. not available on tile.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

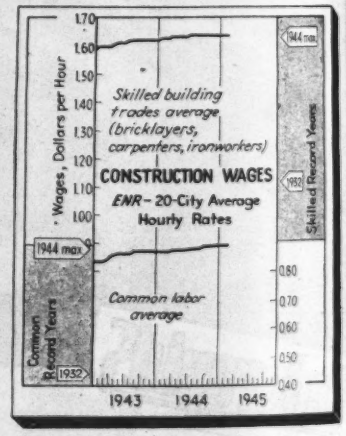
	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb in oil	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *b*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f.o.b. factory Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 350 lb. bbl. per ton
Atlanta	$10.25	$14.125	$1.30	$2.25	$1.20	$1.90	$1.61	$1.61	$0.27	$29.00
Baltimore	10.00	13.75	2.00	3.00	2.50	2.30	2.70	2.70	.40	29.00
Birmingham	10.25	14.125	2.35	3.50*r*	1.98*r*	2.10	2.03	2.03	.32	28.33
Boston	10.00	13.75	1.75	2.50	2.31	2.00‡*h*	3.30‡*uv*	3.30‡*uv*	.25‡	21.00‡
Chicago	10.00	13.75	....	....	....	1.75*hf*	1.74*hf*	1.82*hf*	.33*f*	23.00*f*
Cincinnati	10.00	13.75	1.70	2.90	1.60	2.20	2.10*h*	2.10*h*	.33	25.00
Cleveland	10.00	13.75	1.70	2.90	1.60	1.93	1.83*h*	1.83*h*	.25	27.00
Dallas	10.00	14.50	1.88	2.11*n*	.05*l*	1.75*h*	1.66*h*	1.66*h*	.35	39.00
Denver	10.50	14.25	....	....	.27*l*	2.45	2.95	2.95	.35	28.00
Detroit	10.00	13.75	1.75	3.00	1.60	2.25	2.25	2.25	.50	23.00
Kansas City	10.00	13.875	2.30*g*	2.55*gr*	2.16*g*	2.19	2.30	2.30	.28	27.50
Los Angeles	10.25	14.25	1.60	2.25	2.30	2.10	1.50	....	.45	.....
Minneapolis	10.00	13.875	....	....	....	1.80*i*5*i*	1.7098*hi*	1.7098*hi*	.32	23.00
Montreal	.....	11.05	2.50*p*	4.90*p*	3.15*p*	4.02*t*	2.58*t*	3.01*t*	.89*t*	2.10*tr*
New York	10.00	13.75	2.03	....*r*	1.82	1.7098	1.6273*o*	1.6273*o*	.26	23.00
Philadelphia	10.00	13.75	1.60/1.80	2.20*r*	1.55	1.75	1.66	1.66	.32	23.00
Pittsburgh	10.00	13.75	1.05	1.95	.80	1.95	1.84*h*	1.84*h*	.34	26.00
St. Louis	10.00	13.75	2.28*s*	2.89*s*	1.96*s*	2.05	1.93	1.93	.34	24.00
San Francisco	10.25	14.00	1.80	2.75*n*	1.35	1.71	2.40	2.40	.33	20.50
Seattle	10.25	14.25	1.90	3.00	....	2.15	2.16*h*	....	.35	26.50*j*

‡ Delivered. Note: Red lead in oil 80c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% minimum ferric oxide. *e* Subject to 25% discount. *f* Distributors' price to contractors. *g* 5 gal. can. *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Asphalt pitch. *k* Per 100 lb. *l* Per lb. *m* Per bbl. *n* May, 1941 price. *o* 60-lb. roll. *p* Plus 8% sales tax. *r* Not available, except on priority rating; then quoted specially. *s* December, 1942 price. *t* Federal tax included. *u* 90-lb. roll. *v* Truck delivery.

SKILLED AND COMMON WAGE RATES—PER HOUR

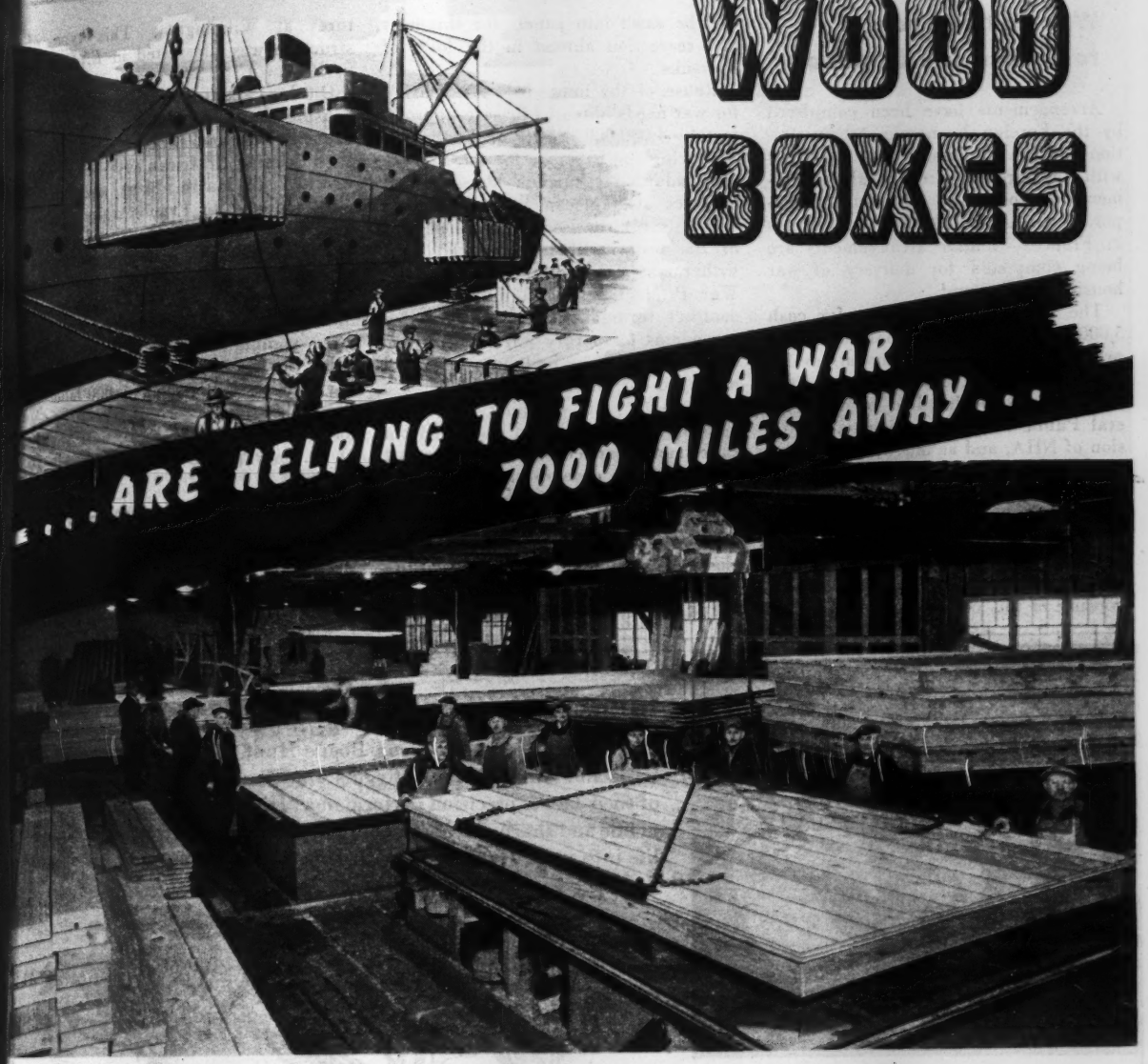
	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor—Building	Common Labor—Heavy Const.
Atlanta	$1.50	$1.25	$1.50	$1.25	$1.50	$0.40	$0.50
Baltimore	1.75	1.4375	1.80	1.625/2.00	1.725	.80	.80
Birmingham	1.75	1.25	1.50	1.25/1.50	1.50	.65	.65
Boston	1.625	1.50	1.65	1.50/1.875	1.667	1.00	1.00
Chicago	1.75	1.70	1.76	1.75	1.825	1.10	1.10
Cincinnati	1.875	1.50	1.675	1.40/1.55	1.625	.85	.85
Cleveland	1.875*c*	1.575	1.875	1.875	1.875	1.085	1.125/1.155
Dallas	1.625	1.25	1.50	1.75	1.625	.60	.75/1.25
Denver	1.65*b*	1.50*b*	1.50*b*	1.50/1.625*b*	1.50/1.65	.80*b*	.80*b*
Detroit	1.725	1.50	1.825	1.675/1.825	1.725	.90/100	.90
Kansas City	1.65	1.50	1.625	1.675	1.70	.975	.90
Los Angeles	1.50	1.35	1.625	1.375	1.667	.875	.875
Minneapolis	1.625	1.44	1.625	1.50	1.625*e*	.95	.95
New Orleans	1.50	1.25	1.50	1.50	1.375	.65	.75
New York	2.00*b*	1.85*b*	2.00	2.00*b*	2.00*b*	1.10*f*	1.00
Philadelphia	2.00	1.58	2.00	2.00	2.00	.825	.825
Pittsburgh	1.90	1.75	1.75	1.8125	1.875	.90	.80
St. Louis	1.75	1.50	1.75	2.00	1.75	1.00	1.00
San Francisco	1.875	1.50	1.75	1.50/1.75	1.75	1.00	1.00
Seattle	1.845	1.565	1.745	2.00	1.865	1.145	1.145
Montreal*	1.05	.95	1.00	.90	1.00	.60	.65

b 7 hr. day. *c* Prevailing rate on government work. *e* 35 hr. wk.
* Cost of living bonus now included in basic wage.



ENR Skilled Average; (Bricklayers, Carpenters, Ironworkers) $1.641.
ENR Common Average; $0.891.

HINES HEAVY DUTY WOOD BOXES



The U. S. Army Engineers Manual reads: "Boxes in which equipment is packed (for overseas shipment) must be of sufficient strength to withstand severe treatment during numerous loadings and unloadings under adverse conditions." Hines is proud that its lumber manufacturing, distributing, and handling facilities; and its engineering know-how in working wood have earned the assignment of mass producing some of the largest and heaviest export boxes used in this war of far flung supply lines.

EDWARD HINES LUMBER CO.

CHICAGO, ILLINOIS • ESTABLISHED 1892

(Continued from page 93)

War housing sold to France and England

Arrangements have been completed by the Foreign Economic Administration and the National Housing Agency with the French Provisional Government to produce in this country temporary shelter for 150,000 war workers in France. Similar arrangements are being completed for delivery of war housing to England.

The French will purchase for cash 5,000 or more 20 x 48-ft. barracks, each providing sleeping accommodations for about 30 persons. Procurement of the housing is to be handled by the Federal Public Housing Authority, a division of NHA, and as much of the order as possible will be filled from surplus war housing in this country. FPHA will produce approximately 500 barracks from 1,300 temporary family units, part of which are at Niagara Falls, N. Y., and are not suitable for reuse as war housing in this country. The buildings will be sawn into panels for shipment and reerection abroad in the form of barracks.

Reuse of the unneeded war housing for war needs abroad will save approximately 4,000,000 b. ft. of lumber in producing the barracks for the French. Any additional surplus housing that becomes available in the near future will be similarly used. The remainder of the order will be produced new, within material limitations imposed by War Production Board, under private contract through FPHA in the same manner as temporary war housing, except that it will be built in panels and packaged for shipment.

Possibility of shipping packaged housing for reuse abroad resulted from experiments carried out during the last few months to develop methods for reusing housing structures during the war and of disposing of them when the war need is over. The French buildings closely resemble a one-story utility type building constructed from panels sawed from two-story family-unit structures at Wilmington. This type of structure was illustrated in *ENR* Nov. 9, 1944 vol. p. 589.

On Jan. 22, twenty-six prefabricated housing units to shelter about 1000 French dock and transportation workers unloading American supplies at war-wrecked Le Havre, Brest and Rouen were shipped to France from Dallas, Tex., by the National Housing Company of Dallas. The shipment was part of an export order for temporary housing for 150,000 French workers. The company built and shipped the units eleven days after signing the contract and John Allen Boyle, of the firm, said more housing units to shelter about 7,000 laborers would be shipped within the next ten days. Each housing unit will shelter about forty people. Dimensions are 20 by 48 ft.

Britain wants 30,000 units

Under a lend-lease arrangement with the British government the United States government will soon supply 30,000 prefabricated houses for families

ONE OF A SET OF 8 GAME BIRD PLATES PRODUCED BY SUN-GLO STUDIOS FROM LYNN BOGUE HUNT'S DRAWINGS

HIGGINS INKS engrave your ideas accurately

Such famous artists as Lynn Bogue Hunt — master portrayer of birds and animals — use Higgins American Drawing Inks because of their facile, precision performance. Higgins inks insure delicacy of line and sharpness under complete control. Build character and life into your drawings — with Higgins American Drawing Inks.

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271 NINTH ST., BROOKLYN 15, N. Y.

PORTABLE BENCHMARKS...

WOULD ANSWER THE SURVEYOR'S DREAM... The W&T Altimeter of course isn't a benchmark but in surveys requiring accurate vertical control its sensitivity of *one part in eight thousand* gives the freedom and convenience of a benchmark wherever you need one.

Shock mounted for rough handling in a 6 x 6 x 4 inch hardwood case the instrument weighs only 2½ pounds.

Two ranges are provided: 0 to 7,000 feet and 0 to 16,000 feet, each individually calibrated and temperature compensated to achieve the maximum in speed and accuracy of reading.

Write today for illustrated technical bulletins.

A-37

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BELLEVILLE 9 NEW JERSEY

Unsurpassed for Performance!

Carver Pumps stay on the job at top capacity even after hundreds of hours of hard service because of their simplicity, trouble-proof design and superior construction. Simplicity means fewer parts to require attention. The recirculation tube is scientifically designed to provide fastest priming, peak efficiency, and correct amount of recirculation to keep priming chamber free from clogging deposits of silt, sand or dirt. Lifetime seal, special long-life impeller and renewable liner assure minimum of maintenance. Carver Certified Pumps are available in sizes from 1½" to 10" with capacities from 3,000 to 200,000 gallons per hour. For details, see your Carver distributor or write.

THE CARVER PUMP CO.
Muscatine, Iowa

CARVER CENTRIFUGAL
Certified PUMPS

of war workers in England who have been bombed out by the enemy. The contract, which will involve about $60,000,000, is being arranged by the Foreign Economic Administration and the Federal Public Housing Authority.

The homes will be one-story, single family structures, intended to house a family of four persons, so that shelter will be provided for about 120,000, on a rental basis. Each home will consist of two bedrooms, a living room, kitchen, bath and probably a small dining space. Equipment will be on a minimum basis.

Most of the new homes will be for the London area, but Coventry, Plymouth and other badly damaged places will also get some of them. The British government will arrange for the erection of the homes.

Since lumber is now a very critical item here, as far as possible substitute products will be used in the prefabricated units to be sent to England.

It is understood that the Federal Public Housing Authority will invite bids from prefabricators and other manufacturers after final authorization is received from the War Production Board for the release of the necessary materials.

. . .

Ranchers fear loss of Central Valley water

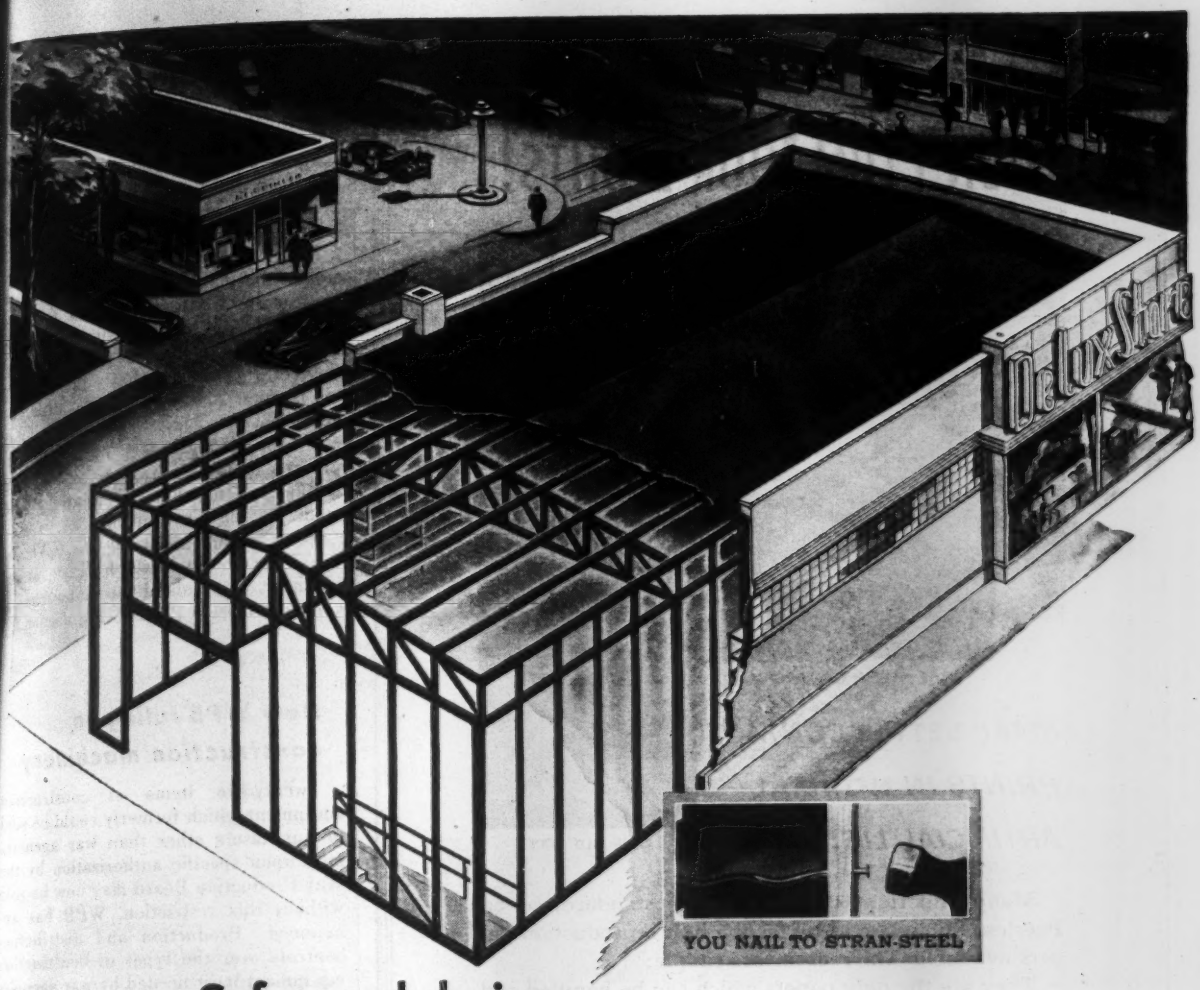
Charged with an attempt to assume power to control waters of the San Joaquin River in a manner contrary to the provisions of the Central Valley Project Act, Secretary of the Interior Harold L. Ickes and other Interior Department officials were named defendants in an injunction suit filed recently by a Merced, Calif., rancher.

In an effort to forestall what were termed threatened "illegal acts", the suit protests the intended diversion of San Joaquin River water from Friant Dam through the proposed CVP Friant-Kern canal unit to arid, undeveloped areas in Kings, Tulare and Kern counties.

Such diversion would in effect rob ranches and farms in the grasslands area surrounding Merced of a vital, natural water supply they have enjoyed for generations and also lower the area's water table, it was charged.

Brought by Elon P. Close, owner of a 1,377-acre ranch, in behalf of himself and other ranchers in the grasslands area, the suit is not intended to block completion of the CVP, but to "expedite the fundamental purpose of the project—the conserving and utilizing of surplus water in the San Joaquin and Sacramento rivers."

Depriving the grasslands area of irrigation water to supply an undevel-



Safeguard design with the permanence of steel

Stran-Steel, the light steel framing member with the patented nailing groove, has taken its place as a universal building material, bringing new efficiency and flexibility to building design. Small homes, apartment buildings, factories and other commercial structures may be built economically and quickly with Stran-Steel—by builders who are accustomed to other types of construction.

Stran-Steel, new and improved, is a precision construction material of unlimited adaptability. Joists, studs and plates are of steel—steel for strength, durability, uniformity and fire-safety—steel for speed of erection, rigidity, freedom from warp and sag—steel for permanence. Design in steel; build the world of tomorrow in steel. Explore the possibilities of standardized Stran-Steel.

Think in terms of

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GREAT LAKES STEEL CORPORATION

STRAN-STEEL DIVISION • 37TH FLOOR PENOBSCOT BUILDING

DETROIT 26, MICHIGAN

UNIT OF NATIONAL STEEL CORPORATION

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THE OLD WAY

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They are the *only* papers which can be handled and processed under normal artificial light.

They are the *only* papers with an anti-diffusion emulsion—giving greater latitude, greater contrast, greater density.

They are the *only* silver-emulsion papers which can be run in any kind of continuous ★blueprint machine.

They reproduce pencil drawings without loss of fine detail. Every line is intensely black, clean and sharp.

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oped area, would be in direct opposition to the provisions and spirit of the CVP, the complaint contends.

A court decree containing a formula for regulation of the flow of the San Joaquin at Friant Dam so that "prior rights of water users in the grasslands area" will not be interfered with also was asked by the plaintiff.

Meanwhile, the move to obtain control of the mammouth multiple-purpose project by California gained momentum. Rolland Vandegrift, legislative auditor, proposed three plans whereby the state could purchase the project by issuing 2 percent bonds with 30-year maturity. Each involved taking over the $155,000,000 spent on the project so far and all or part of the further $160,000,000 appropriation made by the Government.

State management of the CVP is urged by both Edward Hyatt, state engineer, and Roland Curran, manager, Central Valley Project Association.

• • •

New WPB ruling on construction machinery

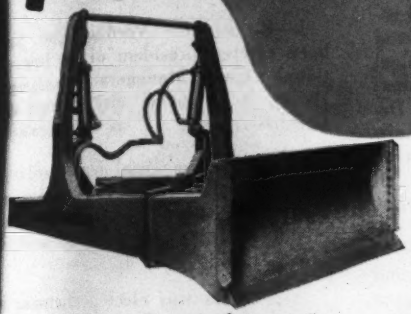
Twenty-five items of construction equipment which formerly could be sold to purchasers other than war agencies only upon specific authorization by the War Production Board may now be sold without this restriction, WPB has announced. Production and distribution controls over the types of construction equipment most needed by war agencies remain unchanged.

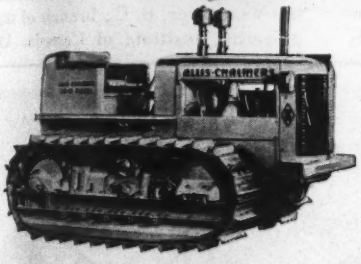
Order L-192, as amended Jan. 17, transfers from Schedule A to Schedule B the following 25 items: Batchers and batching plants for construction work; portable and stationary type bins; bulk cement handling plants; bituminous distributors; water distributors; draglines; concrete paving finishers; hoists; mud jacks; tractor-drawn logging arches; concrete mixers above 7-cu. ft. capacity; concrete truck mixers; concrete pavers; soil stabilizing plants; snow plows; concrete pumps; engine or electric-motor-driven water pumps mounted on skids or trailer-mounted larger than 90,000 gph.; carrying and hauling scrapers under 2 cu. yd. capacity; bituminous sprayers over 300 gal. capacity; concrete paving spreaders; crawler trailer wagons; portable washing and screening plants; and crawler trailer wheels (complete assemblies).

Schedule A items may be sold to war agencies without restriction and to other purchasers only on specific WPB authorization. Schedule B items formerly could be sold only on purchase orders rated AA-5 or better. This rating requirement has been removed from the amended order.

LIKE A COMB AND BRUSH—

They Go Together!





BAKER

Baker Bulldozers + Allis-Chalmers Tractors = performance. Just like a bolt and a nut or a comb and brush go together—so do Bakers go with Allis-Chalmers Tractors. Every unit in the complete Baker Bulldozer and Gradebuilder line is "tailor-made" for installation on A-C Tractors—*a model for every size crawler tractor.*

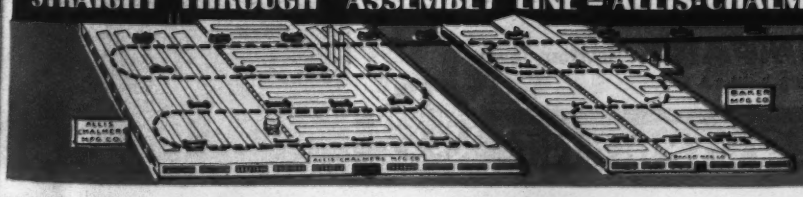
Here are two organizations working side by side—each a specialist in its chosen field—giving you all of the benefits of a tractor-bulldozer unit "designed and made under one roof." From the very inception of a new tractor or tractor equipment, engineers of both firms confer on design and dovetail plans. Here, too, is a nationwide dealer organization equipped to render super-service on tractor and bulldozer alike. *Thousands of users among contractors, public works officials and in many industries will verify that Baker Bulldozers or Gradebuilders and A-C Tractors go together!*

THE BAKER MFG. CO.

567 Stanford Ave. Springfield, Ill.

If it concerns Victory, it concerns us!

"STRAIGHT THROUGH" ASSEMBLY LINE – ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

Elections and Activities

C. H. McAllister has been elected president of the Wilmington, N. C., Engineers Club. Other officers are: T. R. Cobb, vice-president; H. E. Hicks, secretary and treasurer; J. B. Lashley and G. B. Thomas, directors.

Van Court M. Hare Sr., has been elected president of the Technical Society of Knoxville, Tenn., succeeding Robert H. Witten. Armour T. Granger and Max C. Bartlett were elected first and second vice-presidents respectively, R. A. Hopkins and Oscar L. King, directors.

William Bush, is president of the Philadelphia chapter, Pennsylvania Society of Professional Engineers, succeeding Lewis Klauder resigned. John Costello is vice-president.

Raymond J. Ashton has been reelected president of the Utah Building & Construction Congress. Reelected vice-presidents were John H. Moser, Logan; Ora Bundy, Ogden; Gilbert Williams, Salt Lake City; O. A. Spear, Provo; Henry Jones, Sunnyside, and Arthur Jones, Cedar City. R. A. Hart was reelected secretary-treasurer. Directors are Chester P. Cahoon, Mark Tuttle, Lester B. Johnson, Herbert A. Snow, S. S. Smith, R. L. Irvine, B. W. Butler, A. A. Maycock and C. A. Wolfrom.

Beaumert Whitton has been installed as president of the Charlotte, N. C., Engineers Club. He succeeds H. B. Wolf, director. Others elected are: Glenn E. Park, vice-president; Joe L. Greenlee, treasurer; Charles M. Stone, secretary; and David Nabow, John E. Fox, C. W. Gilchrist and B. B. Parker, directors.

Engineering and technical societies in Seattle, Wash., and vicinity, which are sections or chapters of national societies, have formed the Puget Sound Council of Engineering and Technical Societies, patterned after the National Engineers Council for Professional Development. Nathaniel A. Carle is chairman. Among other representatives of the groups are: Seattle section of American Society of Civil Engineers, Richard Ellis and A. L. Miller; Tacoma section of American Society of Civil Engineers, C. A. Strong and Ralph Finke; Western Washington section of American Society of Mechanical Engineers, R. L. Rockwell and F. B. Lee; North Pacific section of American Institute of Mining and Metallurgical Engineers, J. B. Umpleby and D. L. Pitt; and the Washington branch of the Society for the Promotion of Engineering Education, H. J. McIntyre and R. Q. Brown.

C. E. Painter, Salt Lake civil engineer, vice-president of the Waterworks Equipment Co., has been appointed secretary-treasury of the intermountain section, American Society of Civil Engineers, to fill the term left vacant by the death of Lt. Col. Fred H. Richardson.

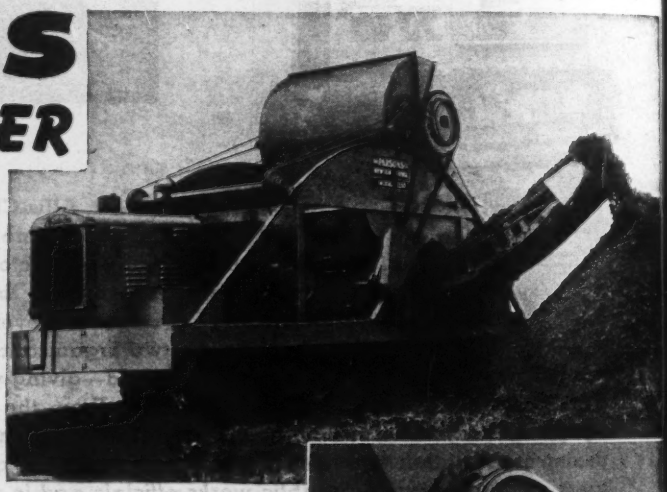
J. R. French, Verdun, Que., has been elected president of the International City Managers Association. Henry A. Yancey, city manager of Greensboro, N. C., is vice-president.

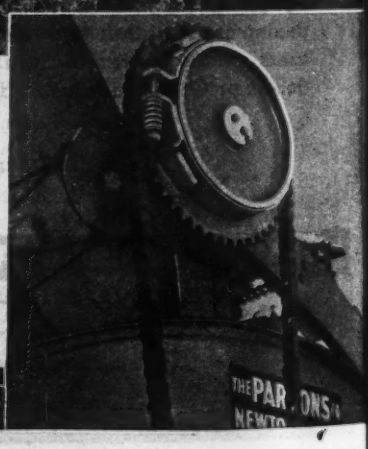
Contractors, material dealers and representatives of other construction industries recently organized an Arkansas chapter of the National Association of Home Builders.

A. Peebles was elected chairman of the Vancouver, B. C., branch of the Engineering Institute of Canada. Others

PARSONS
250 TRENCHLINER

● Large rocks or heavy roots, shock loads of any kind can't damage the Parsons 250 Trenchliner. Safety overload clutch slips and stops machinery when buckets hit impassable obstructions in the trench. Band type safety clutch is spring loaded, quickly adjusted to provide proper tension for any type of digging.





Band type safety clutch is spring loaded, easily accessible, quickly adjusted.

THE PARSONS COMPANY Newton, Iowa
KOEHRING SUBSIDIARY
TRENCHING EQUIPMENT

• Twenty-five leading equipment dealers in twenty-five principal cities throughout the United States are now authorized dealers for the Wood Roadmixer. More are being appointed. Prospective purchasers and present owners of Wood Roadmixers, wherever they may be, now have access to convenient, on-the-spot sales and service facilities.

The names and addresses of these dealers are shown in this advertisement. See them or write them for descriptive literature and costs on the Wood Roadmixer—the pioneer and leading travel plant method of low cost, high quality pavement construction.

AUTHORIZED WOOD ROADMIXER DEALERS

ALBUQUERQUE, New Mexico
Hardin & Coggins
1717 No. Second

BALTIMORE, Maryland
Alban Tractor Co., Inc.
721-727 E. 25th St.

BILLINGS, Montana
Industrial Equipment Co.,
415 No. 27th St.

CHEYENNE, Wyoming
Wortham Machinery Co.,
517 West 17th St.

CINCINNATI, Ohio
The Bode-Finn Co.
1654 Central Ave.

COLUMBIA, South Carolina
Southern Equipment Sales Co.,
P. O. Box 1341

DES MOINES, Iowa
Herman M. Brown Co.
1st & Sheridan Sts.

DETROIT, Michigan
W. E. Phillips Equipment Co.
7279 Artesian Ave.

HYDE PARK, Massachusetts
Parker-Danner Company
25 Factory St.

JACKSONVILLE, Florida
Florida-Georgia Tractor Company
P. O. Box 1649

KANSAS CITY, Missouri
The G. W. Van Keppel Co.
2440 Pennway

LOS ANGELES, California
Garlinghouse Bros.
2416 East 16th St.

MEMPHIS, Tennessee
Tri-State Equipment Co.
124 East Calhoun Ave.

MILWAUKEE, Wisconsin
Hunter Tractor & Machinery Co.
327 South 16th St.

MINNEAPOLIS, Minnesota
Rosholt Equipment Co.
3138 Snelling Ave.

NEW ORLEANS, Louisiana
Woodward, Wight & Co., Ltd.
451 Howard Ave.

NEW YORK, New York
H. O. Penn Machinery Co.
140th St. & East River

NORFOLK, Virginia
Hampton Roads Tractor & Equip. Co.
W. 39th St. & Killam Ave.

OKLAHOMA CITY, Oklahoma
Herd Equipment Co.
922 N. W. 5th St.

OMAHA, Nebraska
Fehrs Tractor & Equipment Co.
1809 Cuming St.

PHOENIX, Arizona
State Tractor & Equipment Co.
P. O. Box 3795

RALEIGH, North Carolina
North Carolina Equipment Co.
3101 Hillsboro St.

SALT LAKE CITY, Utah
Arnold Machinery Co., Inc.
153 West 2nd South St.

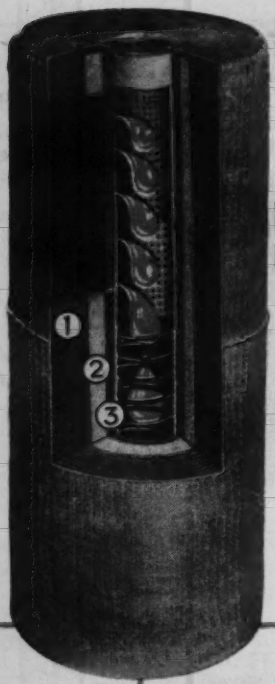
SAN ANTONIO, Texas
J. E. Ingram Equipment Co.
1146 West Laurel St.

SAN FRANCISCO, California
Coast Equipment Co.
948 Bryant St.

WOOD ROADMIXER

Wood Manufacturing Co. • 816 West 5th St., Los Angeles 13, California

BRIGGS OIL CLARIFIERS



Provide

LONGER LIFE FOR ENGINES
LONGER LIFE FOR LUBE OIL

Briggs Fullers Earth Type Oil Clarifiers ARE different from ordinary oil filters because, by combining cellulose with molded Fullers Earth, oil is filtered, purified and clarified.

This type of filtration maintains lube oil in "refinery-pure" condition—a factor in lube oil costs, equipment life, maintenance and productive time.

For efficient filtration of additive-type oils, Briggs manufactures the DISCEL (All Cellulose) Cartridge.

There is a Briggs Oil Clarifier for every size and type internal combustion engine. Get the complete story . . . from the Briggs distributor listed in the "Filter" section of your classified telephone directory or write to manufacturer.

Oil Is Cleaned 3 TIMES—3 WAYS through a Briggs Fullers Earth Cartridge.

1 Dirty oil passes through outer layer of cellulose where particles of carbon, dirt and metal chips are removed by ABsorption.

2 Partially cleaned oil passes through patented, molded Fullers Earth cylinder where gums, acids, resins . . . that cause formation of engine sludge . . . are removed by ADsorption.

3 Finally — oil passes through inner layer of cellulose where particles as small as 1 micron (.00004") are removed by ABsorption.

BRIGGS FILTRATION IS ENGINE PROTECTION

Briggs
PIONEERS IN MODERN OIL FILTRATION

BRIGGS CLARIFIER COMPANY
General Offices
WASHINGTON 7, D. C.

elected were R. C. Pybus, vice-chairman; J. G. D'Aoust, secretary-treasurer; P. B. Stroyan, news editor; G. W. Allan, J. P. Fraser, N. D. Lambert, J. M. Rothwell, F. H. Ballou and J. A. James, executive committee.

J. G. Wright, San Francisco consulting engineer, was elected 1945 president of the Structural Engineers Association of Northern California recently, succeeding Clarence E. Seage. Mr. Wright, vice-president of the association for 1944, was replaced by Harold M. Engle, San Francisco. Two new directors to serve with Mr. Wright, Mr. Seage and John J. Gould are William Adrian and Mr. Engle, all San Francisco engineers.

A. V. Foltz, assistant superintendent of the Findlay, Ohio, waterworks, has been elected president of the Ohio Northern chapter of the Ohio Society of Professional Engineers. Norris Stultz of Findlay, was elected secretary-treasurer, and R. B. Vogel of Carey, Alex Webb of Ada, and John Stough of Findlay, were named directors.

Frank W. Mouery has been re-elected chairman of the Youngstown, Ohio Metropolitan Housing Authority for 1945. Ray G. Hagstrom was renamed vice-chairman, and Paul L. Strait, director and ex-officio secretary. Mouery also has been renamed by Mayor Ralph W. O'Neill for another five-year term as one of the five members of the authority.

Frank Kerekes, professor of civil engineering at Iowa State College, is president of the Iowa section of the American Society of Civil Engineers. Other officers are: Earl Waterman, Iowa City, vice-president; L. O. Stewart, Iowa State College, Ames, secretary-treasurer; J. M. Tippee, Des Moines, director for one year, and J. P. McKean, Iowa State College, director for two years.

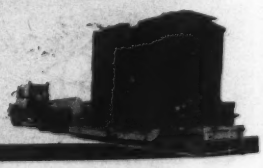
on ROGERS TRAILERS

TODAY even airplanes "bum a ride" on ROGERS TRAILERS. Deck houses for Victory ships . . . huge coastal defense guns . . . giant tanks, all are speeded towards completion and rushed to the fighting fronts on ROGERS TRAILERS.

In War and in Peace ROGERS TRAILERS have proven their ability to "deliver the goods". New models which will be available when war contracts are completed will be even better-engineered . . more efficient than the thousands which have been used successfully by industry for many years.

ROGERS BROS. CORPORATION
ALBION,
PENNA.

EXPERIENCE builds 'em
PERFORMANCE sells 'em

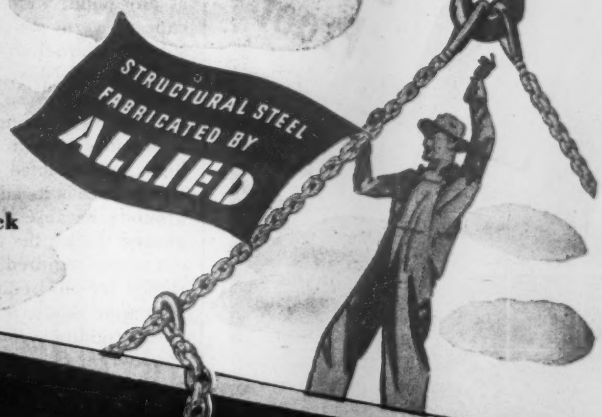


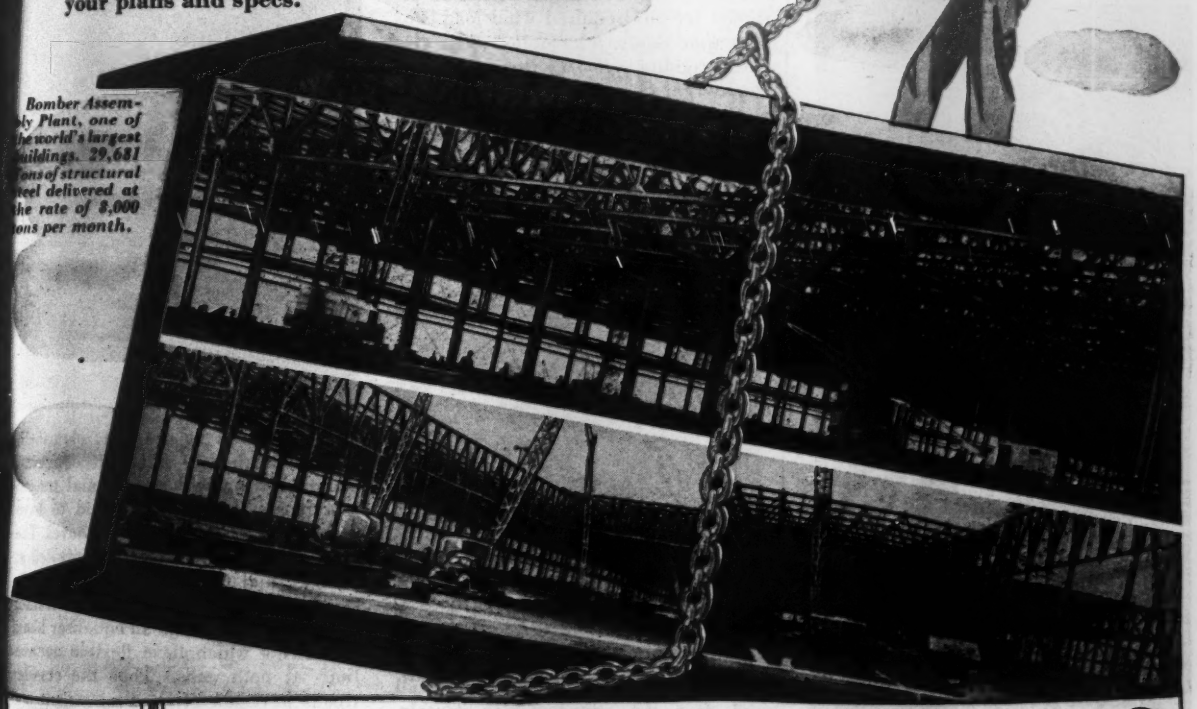
"ALLIED delivered every section of structural steel on schedule . . ."

Rapid, precision **fabrication of mass tonnage for steel structures is Allied's contribution to vital industrial expansion.**

When engineers and layout men who have vision and creative ability ally with large plant facilities and a quarter-century of experience in getting down to cases with architects, engineers, and contractors—fabricating service becomes a fast-moving, co-ordinated effort.

Your **structural steel problem will find quick and satisfactory solution here. Send your plans and specs.**





Bomber Assembly Plant, one of the world's largest buildings. 29,681 tons of structural steel delivered at the rate of 8,000 tons per month.

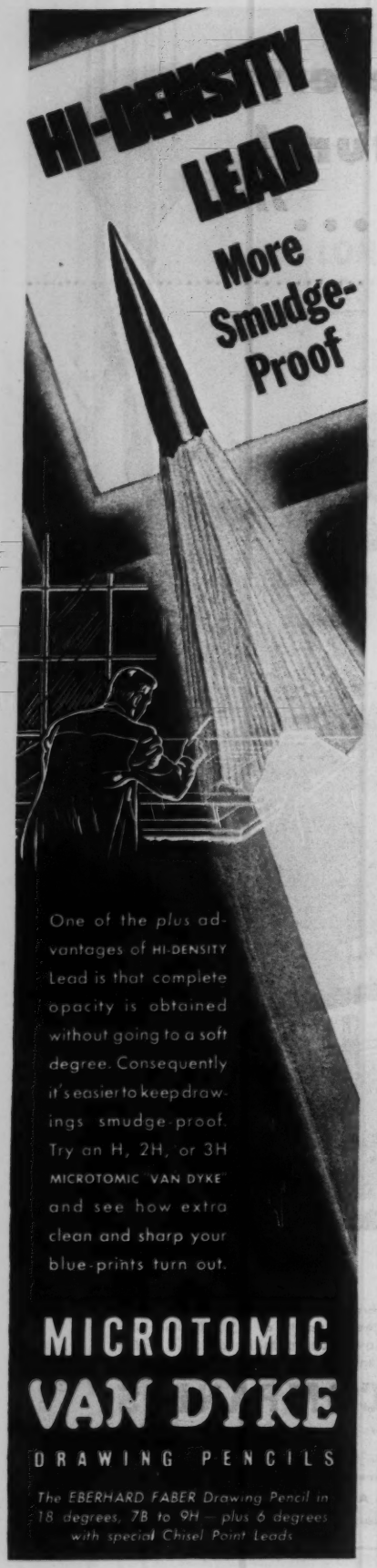
ALLIED
STRUCTURAL STEEL COMPANIES

Three companies, with total structural steel capacity of 75,000 tons, who have pooled their facilities under centralized control and responsibility.

Engineers • Fabricators • Erectors

- **CLINTON BRIDGE WORKS, 101 S. Second St., Clinton, Iowa**
- **GAGE STRUCTURAL STEEL CO., 3123-41 S. Hoyne Ave., Chicago 8, Ill.**
- **MIDLAND STRUCTURAL STEEL CO., 1300-20 S. 54th Ave., Cicero 50, Ill.**

Address the company nearest you


HI-DENSITY LEAD
More Smudge-Proof
One of the plus advantages of HI-DENSITY Lead is that complete opacity is obtained without going to a soft degree. Consequently it's easier to keep drawings smudge-proof. Try an H, 2H, or 3H MICROTOMIC VAN DYKE and see how extra clean and sharp your blue-prints turn out.
MICROTOMIC
VAN DYKE
DRAWING PENCILS
The EBERHARD FABER Drawing Pencil in 18 degrees, 7B to 9H — plus 6 degrees with special Chisel Point Leads

New Aids to the Constructor

Vertical Lift Door

Fully counterbalanced, requiring a minimum of electric power for operation, the new Robertson vertical lift door may also be raised and lowered by hand in the event of power failure. The door, which may be surfaced in wood or flat or corrugated metal, may be stopped at any point, which, by preventing escape of warm air at the top, results in substantial fuel saving.

When this door is closed, it forms a wall, and can be fenestrated to meet any building requirement; when open, it provides a clear, column-wide, truss-high, unobstructed opening. An exclusive feature is its adaptability to sloping ground; because the door requires no ground tracks, the bottom panel can be cut to any required angle. It can be designed for any required wind load. For very wide doors, telescoping posts give extra rigidity.—*H. H. Robertson Co., Pittsburgh, Pa.*

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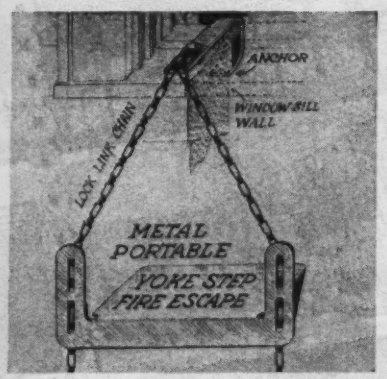
Portable Fire Escape

Of light weight, all-steel construction, a new portable fire escape has 1,880-lb. load strength. It is said to be extremely simple to operate—open the carton,



hook the anchor over a window sill, and drop the carton, which contains the fire escape, out of the window. It has 10x4½-in. metal yoke steps.

This unit is manufactured in 16, 24 and 32 ft. lengths, for use from the second, third or fourth floor of a building. —*Metal-Portable-Fire Escape Co., Murray Bldg., Grand Rapids, Mich.*

• • •

Floor Hardener

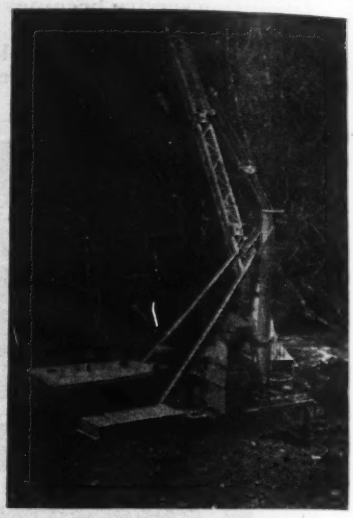
Requiring only the addition of cement and water, a new hardening material, Ferem "Blue Temper," is said to make floors highly impervious to wear, water and chemical disintegration. The principal component of Ferem has a rating of 9 in hardness on the Mohs scale.

Installation of a Ferem floor costs no more than for an ordinary floor, it is stated, and it may be used in new construction, or for patching or resurfacing worn floors.—*A. C. Horn Co., 43-36 10th St., Long Island City 1, N. Y.*

• • •

Versatile Tractor Attachment

A new product, the Hystaway, is essentially boom, mast and stays, designed to be rear-mounted on a tractor, where

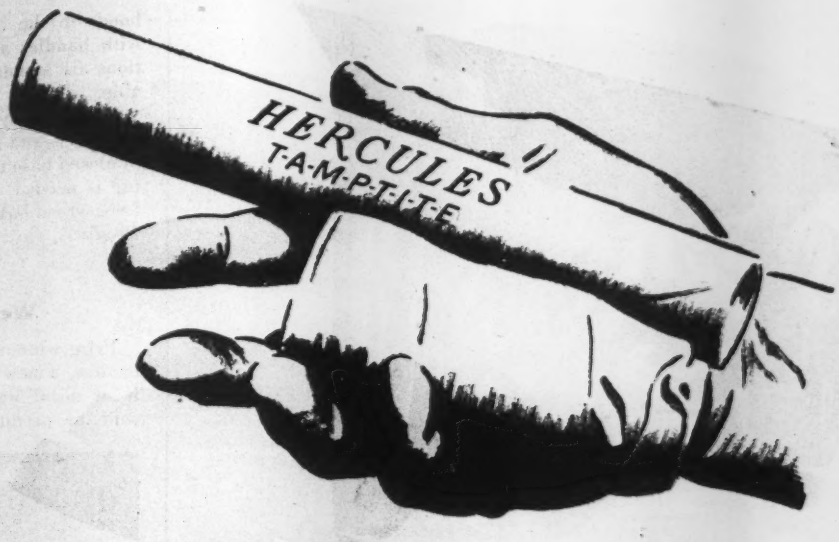


it can be used as dragline, clamshell, shovel, backhoe or skimmerscoop without interfering with the normal tractor functions. This device is said to have more mobility than a power shovel. The boom is backstayed to a mast pivoted at its base and the mast in turn is backstayed to the front part of the tractor roller frames, through an equalizer beam and struts which have flexible connections at both ends. Thus the crawler treads have unrestricted movement and tractor springs are allowed free movement while the attachment is being used.—*Hyster Co., Portland, Ore.*

• • •

Blueprint Cabinet

Especially designed for safe, flat storage of blueprints, charts, drawings, etc., a new steel blueprint cabinet, Models No. 2225-12 and No. 2225-13, has a rigid frame for continuous perfect alignment of drawers. All drawers and compartments are equipped with hinged paperweights in front and protecting



TAMPTITE MAKES

LOADING EASY, SIMPLE, EFFECTIVE

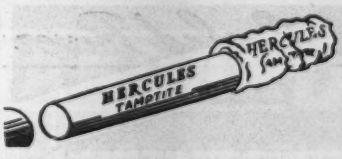
● The power of the dynamite is concentrated in the bore hole for maximum blasting effectiveness when you use Hercules patented Tamptite cartridges. Tamptite shells slide easily into the bore hole, and expand with slight pressure of the tamping rod to fill the hole tightly.

Tamptite cartridges conserve man-hours, eliminate completely the slitting of cartridges and loose, spilled powder around the working area. They give you better breakage, faster handling of materials, and, thus, increased output.

When ordering your favorite Hercules mining explosives, be sure to specify . . . "In Tamptite cartridges."

With Tamptite cartridges, the bore hole is loaded in the usual manner. No wasted time slitting cartridges.

The tamping rod packs the charge snugly in the hole, leaving practically no air space around the dynamite.

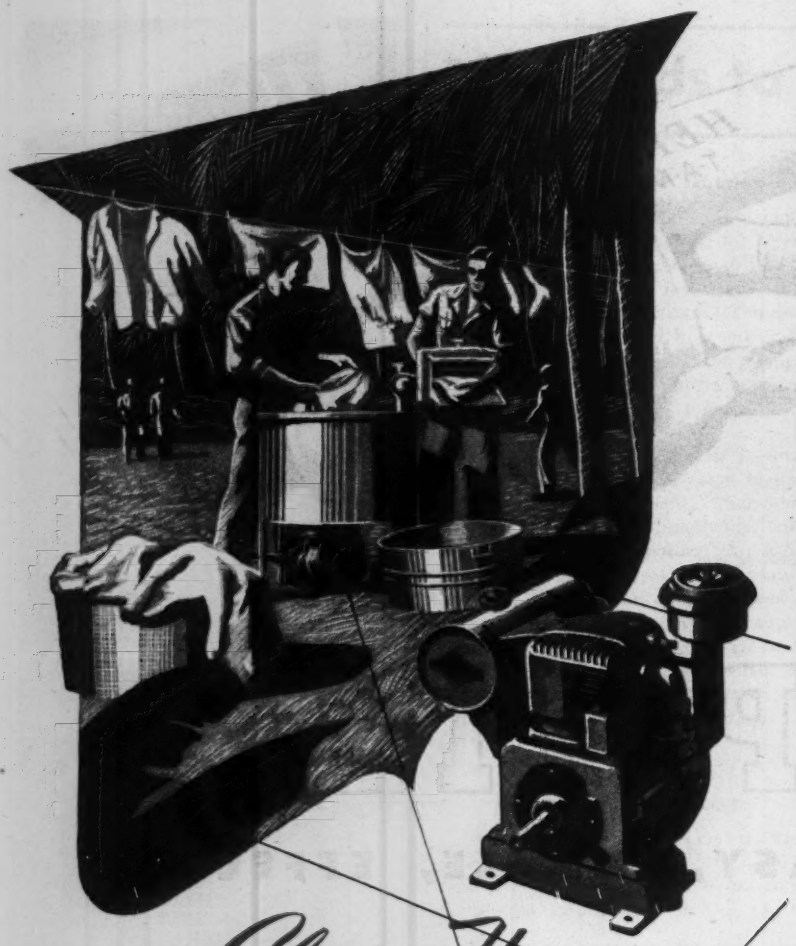


Continue inserting Tamptite cartridges and compressing them until the desired loading is achieved. This compact charge means better breakage, speedier mucking, a faster mining cycle.

XR-51

EXPLOSIVES

HERCULES POWDER COMPANY INCORPORATED 930 KING STREET, WILMINGTON 99, DELAWARE



Cleaning Up on All Fronts!

Our fighting men are doing a double "clean-up job" on all fronts. To combat dirt and disease they use modern washing machines powered by trouble-free, air-cooled Briggs & Stratton gasoline engines — one more service for hundreds of thousands of Briggs & Stratton engines, now "humming" away for Victory.

Air-Cooled Power

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES

Manufacturers, distributors, dealers, and users of all types of appliances, tools, and equipment requiring dependable, compact power units vouch for the performance record of Briggs & Stratton engines. The latest models are backed by the experience gained in twenty-five years of *continuous* production of more than 2,000,000 *Air-Cooled* Gasoline Engines. BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U.S.A.

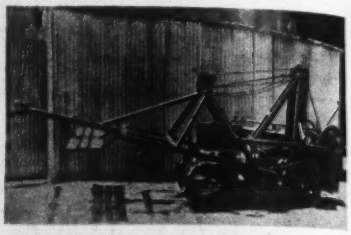
hoods in the rear; they are equipped with handles and label-holders. Partitions are standardized and interchangeable.

Sections may be placed one on top of the other, and either a sanitary (open) or closed base may be used. No finishing top is needed. Cabinets are finished in Lyon green baked enamel.—*Lyon Metal Products, Inc., Aurora, Ill.*

• • •

Welded Driller

Prize winner in a recent arc welding contest, a new driller, named "Jumbo" is of novel welded fabrication, and is said to produce a large quantity of



work. In this machine, the internal combustion is removed from the engine and an air head with four slide valves substituted.

The boom is constructed of 3-in. extra strong pipe. Drill operators stand on a platform which is hinged to the boom in back.—*The Hobart Brothers Co., Hobart Square, Troy 1, Ohio.*

• • •

Powdered Alloys

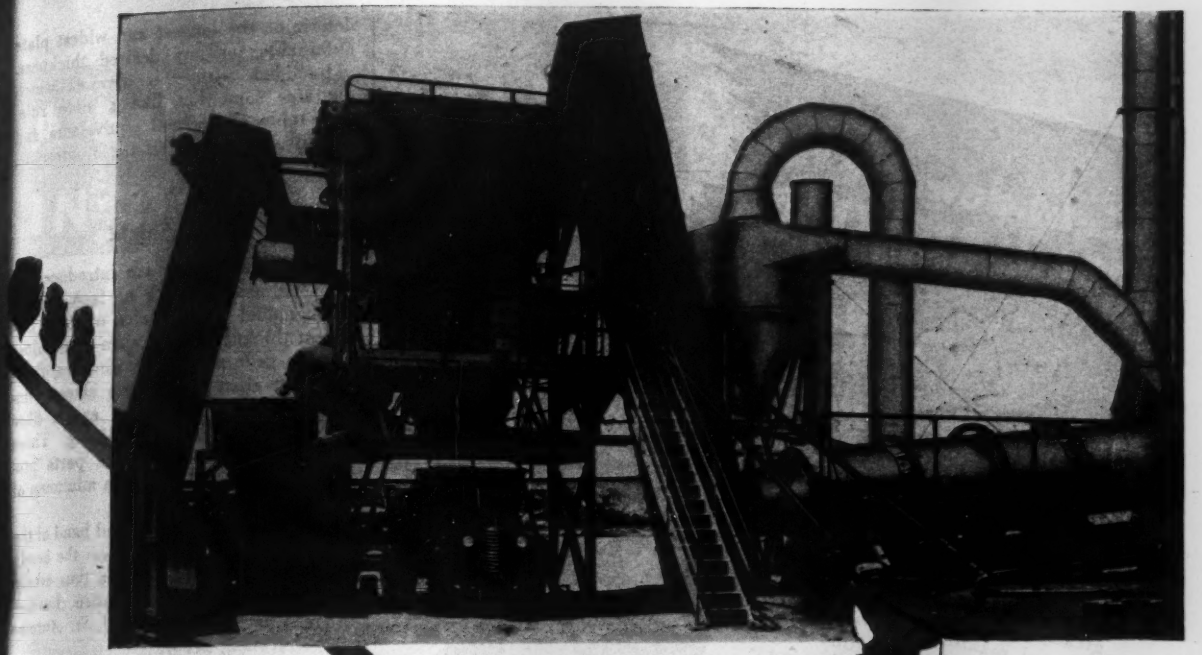
Now available in fine powder form, two silver-copper alloys and one copper alloy have been developed for tipping tungsten carbide and high speed steel tools. The required flux is mixed with the alloy, thus eliminating waste.

The metal flows freely at a very slight increase in temperature above the melting point, it is claimed, since the weld metal is pulverized. Oxidation of tungsten carbide is prevented, as the molten alloy immediately "tins" and adheres to the surfaces being joined. These powdered alloys are known as EutecRod 1800, 1601 and 16. —*Eutectic Welding Alloys Co., 40 Worth St., New York 13, N. Y.*

• • •

Steel Plate Calculator and Selector

A wide range of gages, widths and lengths of steel plate appear on a new combination steel plate weight calculator and size selector. This device, it is said, will quickly determine the theoretical weight of any steel plate from 10 to 200 in. in width and from ¼ to 6 in. in thickness. The size selector will

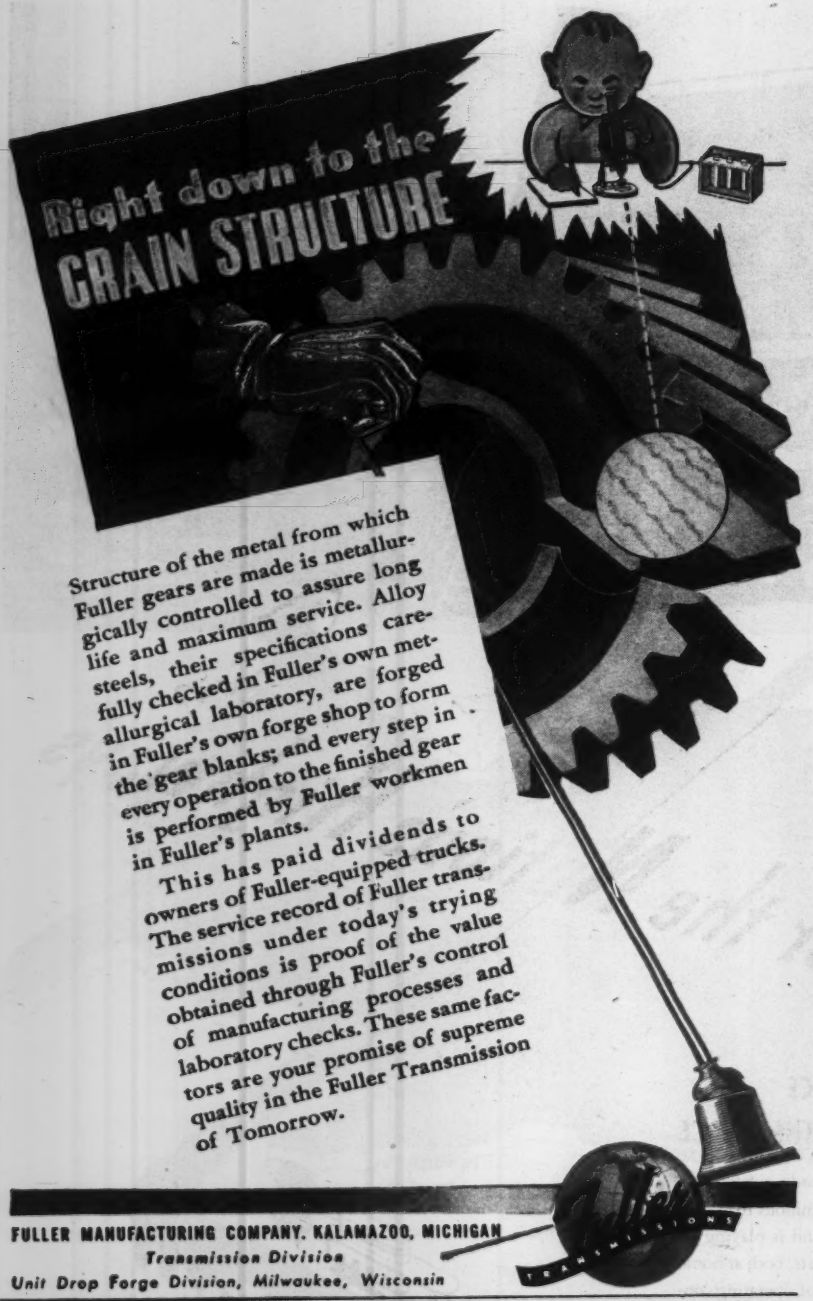


TOUGH WA[illegible] EXPERIENCE
CONDITIONS EQUIPMEN[illegible] FOR THE PEACE

Before the war, Standard Steel's Paving Plants made outstanding production records throughout the country in bituminous road construction. With war, this equipment has played and is playing an important role in the building of many, many airports, both at home and abroad. Performance under the toughest kind of operating conditions has proved the efficiency of this equipment. Not satisfied, however, Standard Steel engineers have plans, already past the drawing board stage, for increasing even more the effectiveness of these great paving plants. It will behoove contractors to keep an eye out for Standard Steel's post-war line of road machinery.

OTHER STANDARD ROAD CONSTRUCTION EQUIPMENT: ROLLERS, SUBGRADERS, BATCHING PLANTS, DRYERS, FINISHERS, BROOMS

STANDARD
STEEL CORPORATION
General Offices and Plant: 5601 South Boyle Avenue, Los Angeles, California



Structure of the metal from which Fuller gears are made is metallurgically controlled to assure long life and maximum service. Alloy steels, their specifications carefully checked in Fuller's own metallurgical laboratory, are forged in Fuller's own forge shop to form the gear blanks; and every step in every operation to the finished gear is performed by Fuller workmen in Fuller's plants.

This has paid dividends to owners of Fuller-equipped trucks. The service record of Fuller transmissions under today's trying conditions is proof of the value obtained through Fuller's control of manufacturing processes and laboratory checks. These same factors are your promise of supreme quality in the Fuller Transmission of Tomorrow.

FULLER MANUFACTURING COMPANY, KALAMAZOO, MICHIGAN
Transmission Division
Unit Drop Forge Division, Milwaukee, Wisconsin

MacArthur

35 YEARS INSTALLING PILES
OF EVERY TYPE

CAST-IN-PLACE CONCRETE COMPOSITE
STEEL SECTIONAL PIPE TIMBER

SOIL AND ROCK EXPLORATION

MacARTHUR CONCRETE PILE CORPORATION
18 EAST 48th STREET, NEW YORK 17, N. Y.
BOSTON • CINCINNATI • NEW ORLEANS

determine the longest and widest plate obtainable for any desired thickness.

Included with this device, which operates somewhat like a slide rule, is a table of decimal equivalents and weights.—*Lukens Steel Co., Coatesville, Pa.*

• • •

Face Shield

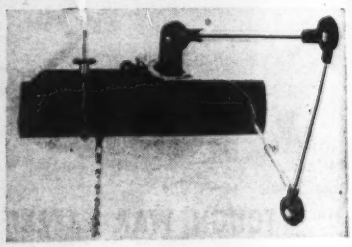
Four new models are introduced in the "Hundred" series of face shields. Each model has a choice of three different thicknesses and sizes of cellulose acetate general-purpose windows, three different sizes of 24-mesh screen windows for heat protection and a fiber front for scarfing and welding. These completely interchangeable parts provide flexible comfort with a minimum of stock.

The adjustable back head band of the shield is to be worn low on the head; the weight of the shield is thus evenly distributed over the entire head.—*Boyer-Campbell Co., 6540 St. Antoine St., Detroit 2, Mich.*

• • •

Protractor

Quick and accurate scribing for cutting on any angle to one-half of a degree is possible with the Trumark protractor for use on pipe, structural shapes and flat sheets. Two stock models and



three sizes are available; the device is made of precision-machined cast bronze alloy and steel tubing. Large joints contain special fiber bearings, which hold correct tension and maintain positive alignment. The protractor has a built-in spirit level, and a marking arm that remains rigid throughout its travel. —*Tru-Line Corp., 759 Venice Blvd., Los Angeles 15, Calif.*

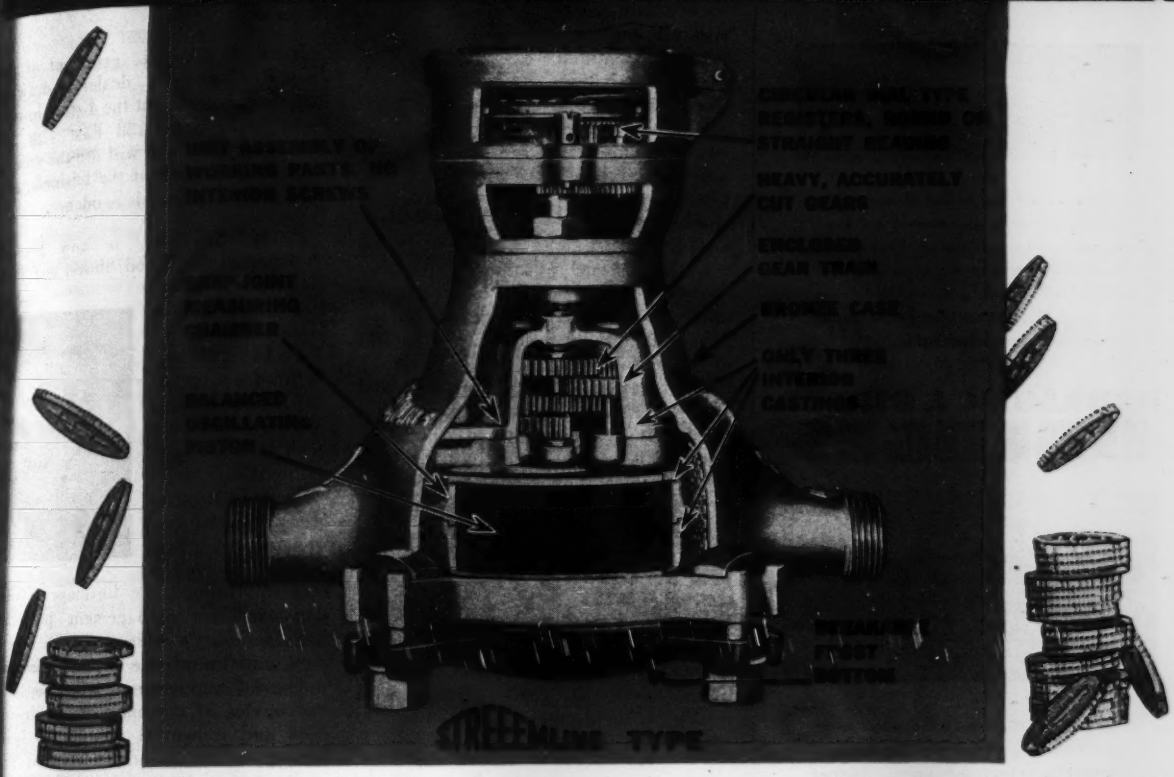
• • •

Fire Retardant

Applicable to lumber or plywood, a new fire-retardant treatment using Pyresote combines fire and decay resistance. Wood so treated meets standard federal preservative specifications and A.S.T.M. fire test specifications.

This treatment may be used for any type of structure from small prefabricated homes up to the largest factory. *Protexol Corp., Kenilworth, N. J.*

A SOUND INVESTMENT IN DOMESTIC MEASUREMENT



Empire BALANCED OSCILLATING PISTON METERS

Meters represent a considerable investment, not only in money but in the time and labor it takes to install and service them. The wise buyer, when purchasing meters, compares both the initial cost as well as the construction features that will contribute to a trouble-free long life of sustained accuracy. He also looks into maintenance expense and, in particular, the ease with which meters can be serviced.

On every score EMPIRE meters stand out as a sound measurement investment. The time-proven EMPIRE balanced oscillating piston provides sustained maximum accuracy with minimum wear. The long service life of all EMPIRE meters can be supported by records extending over a 54 year span.

The utmost accessibility and maintenance ease have been provided in the EMPIRE "Streeemline" type. A snap-joint measuring chamber; only three interior castings that are assembled without screws, plus a design that permits complete assembly of all working parts before they are installed in the meter case contribute to meter shop efficiency and economy. Investigate the EMPIRE "Streeemline" when in the market for meters. You'll find that it sets the value standard against which all others must be judged.

PITTSBURGH EQUITABLE METER CO.

Atlanta — Boston
Chicago — Houston
Kansas City — Pittsburgh
San Francisco — Seattle — Tulsa

MERCO NORDSTROM VALVE CO.
Main Offices, PITTSBURGH, PA.
Los Angeles — New York

National Meter Division, Brooklyn, N. Y.

PITTSBURGH *Water Meters*

★ BOLTED ★
ASD SECTIONAL STEEL

BARGES & HULLS

Widely used by Allied Armies. Prefabricated sections shipped by truck or rail, and overseas as hold cargo. Assembled easily by unskilled personnel at site of use. Liquid or dry cargo. 500 tons up. Outboard motor makes self-propelled units.

HYDRAULIC & DIPPER DREDGES

Backed by 40 years of dredge engineering and operating experience. Complete, integrated units. Dipper and clamshells ¾ yd. up. Hydraulic dredges 8 inches up. All dredges have bolted sectional steel hulls. May be shipped to remote sites and relocated after project is completed

STEEL PLATE FABRICATION

We produce special, difficult weldments for heavy machinery, bases, frames, valves, pressure piping. Oil refinery, by-product coke and gas producer equipment. Stress relieving and annealing.

Write for catalogs on any or all ASD products

AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.

Manufacturers' Activities

BAILEY METER CO., Cleveland, Ohio, announces the appointment of P. S. Dickey as chief engineer. Mr. Dickey will supervise all engineering, research and design activities. He will be assisted by H. H. Gorrie, assistant chief engineer, and R. E. Clark, manager of contract engineering.

In his former position of research engineer, Mr. Dickey has conducted numerous studies here and abroad on the problems involved in the control of both forced and natural circulation boilers in stationary, marine, and mobile service. He is a mechanical engineering graduate from Purdue University and has served Bailey Meter Co. continuously in various engineering capacities since his graduation in 1925.

H. H. Gorrie is a graduate of Rensselaer Polytechnic Institute and has been associated with Bailey Meter Co. continuously since his graduation in 1927.

R. E. Clark is a graduate of the University of Kentucky and has completed over 20 years service with Bailey as field, meter and automatic control engineer.

AFTER A HALF CENTURY devoted to the making of shovels and improving their design and construction, Arch Milligan is retiring as manager of the Dunkirk Works of the American Fork & Hoe Co., Cleveland, Ohio. Mr. Milligan developed the patented process of forging shovels in one piece from a solid bar of steel. He first developed the one-piece solid shank shovel widely used throughout industry. Born in Scotland in 1879, Mr. Milligan entered the shovel manufacturing trade at the age of 15, completing a 5-year apprenticeship in the forging division of the business. During his early years with shovel manufacturers, he gained a broad knowledge in the trade of forging and finishing shovels and served for five years as superintendent of one of Scotland's principal shovel makers.

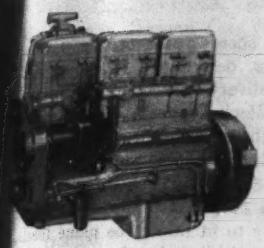
At 30, Mr. Milligan came to Canada where he was employed by the Canadian Shovel & Tool Co. of Hamilton, Ont., to become successively, general foreman in charge of all forging operations for the firm, then superintendent in charge of all manufacturing operations. He joined the Skelton Shovel Works, Dunkirk, N. Y., now a division of the American Fork & Hoe Co. in 1924 as manager, where he continued developing many new features in shovel design and manufacture.

JOHN R. CASSELL, president of the John R. Cassell Co., dealer in drawing materials, has bought the 4-story brownstone building at 138 East 47th St., New York City, and will use the ground floor for a branch of the business, and the upper part for his residence.

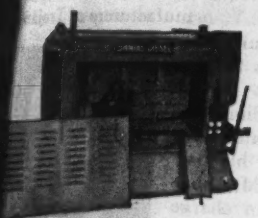
E. H. BRANNING is now general manager of the Wood Shovel and Tool Co. Nov. 1, 1944, he was head of Hardware and Tools Procurement Division of Army Service Forces. Starting with H. Pfeiffer & Son Co., Fort Wayne, Ind., hardware jobbers, some thirty years ago, he worked his way up through the business to various executive management positions. Mr. Branning's wide executive experience and knowledge of hardware and industrial requirements will now be at the service of the many hardware jobbers and industrial distributors being served by the Wood Shovel and Tool Co., as he participates in carrying out the company's plans for a greatly expanded post-war business.

ANNOUNCEMENT of the appointment of Ray C. Nesbitt as sales engineer of Barnes Manufacturing Co., has been made. Nesbitt for the past two years has been connected with the Construction Machinery Branch of WPB in Washington, D. C. Prior to that, he was associated with Ed. Phillips Co., construction equipment distributors in the Middle Atlantic states. Mr. Nesbitt has had a wide experience in the construction field, both sales and engineering. He is making his headquarters at the company's plant in Mansfield, Ohio.

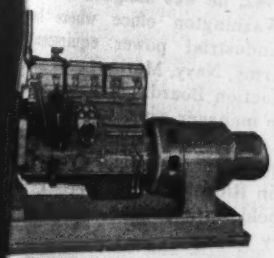
SEVERAL MONTHS ago, the U. S. Corps of Engineers, knowing of the critical need for bituminous distributors to speed the construction of air



e six-cylinder, 150 hp. Model BI-600 Cummins Diesel is a rtable industrial version of the odel H engine . . . the *original* gh speed diesel. It is designed for avy-duty shovels, cranes and nu- erous other types of wheel and ck mounted dirt moving or ma- rial handling equipment in the nstruction and aggregates fields.



odel HP-600 Cummins Diesel is enclosed power unit and is e same engine, basically, as the odel HBI-600, having the same rsepower rating. Like all Cum- ins Diesels, this model has earned ceptance among contractors and gregates producers by its econ- ny, quick cold-weather start- g and its rugged dependability.

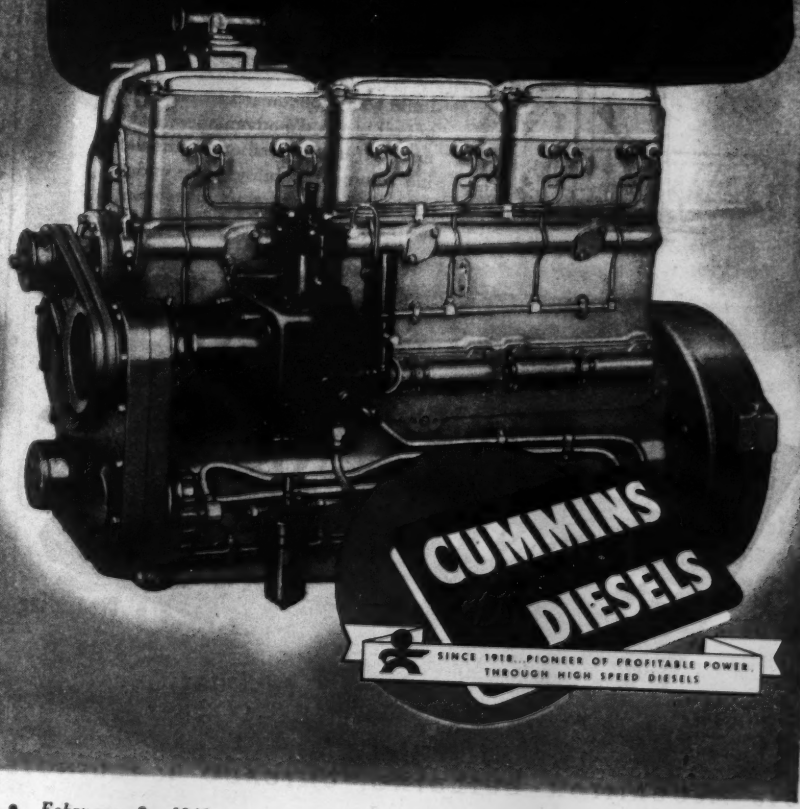


or generating service as well as r direct diesel drive, you can rely n Cummins Dependable Diesels r reliable, low-cost performance. Model HGA-601 (AC) and Model GD-601 (DC) Cummins Diesel enerating Sets are offered with wo ratings: 35 kw. at 900 rpm., nd 50 kw. at 1200 rpm. Other odels are manufactured in ca- acities ranging from 15 to 125 kw. llustrated is the Model HGA-601.

Makes the tough jobs look easy

If yours is a dirt moving or material handling job that demands rugged, heavy-duty power the clock around, then Cummins Diesel power is the power for you. Contractors and aggregates producers who have standardized on Cummins Diesels will attest to their low operating and upkeep cost, their flexibility and quick, cold-weather starting, their dependability, and long life . . . will tell you that Cummins Diesel power makes the *tough* jobs look easy. For your new equipment, plan now to specify Cummins Dependable Diesels.

CUMMINS ENGINE COMPANY, INC., Columbus, Ind.

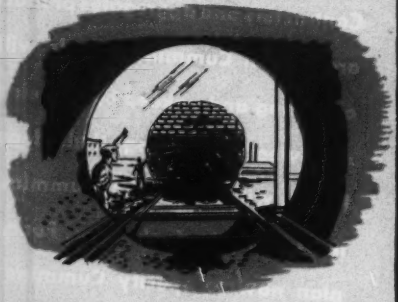


Treated Wood, YES

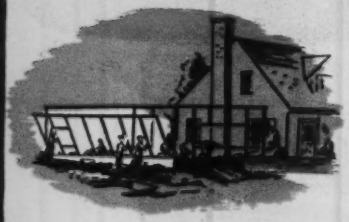
Wolmanized Lumber* is a building material that has a positive answer to the service-life question. It's alloyed for protection against rot and termites.

Pressure Treated, CERTAINLY

The Wolman Salts* preservative is deep in the wood, not just on the surface. Only pressure treatment in closed steel retorts can drive it there.



AND THE USUAL ADVANTAGES OF BUILDING WITH *Wood*



Build with Wolmanized Lumber and get all of wood's advantages: lightness, strength, resilience, insulating value, paintability—plus endurance that insures your investment.

*Registered trademarks

1649 McCORMICK BUILDING, CHICAGO 4, ILLINOIS

fields and access roads on the way to battlefronts, determined to experiment with air delivery of such equipment (the Entyre "Black-Topper"). In cooperation with the manufacturer, the problem was finally solved by assembling each complete distributor, delivering it to the out-bound cargo base, disassembling it sufficiently to fit into three plane loads, then reassembling it when it reached its destination.

Once the solution had been reached, fast action was demanded, with delivery of the first twenty-six units scheduled for less than three weeks. In that time not only was the equipment made but there was also published a complete instruction booklet to show cargo plane loaders how to disassemble and reassemble the distributors.

CONTRACTORS MACHINERY CO., INC., Batavia, N. Y., manufacturers of Trojan Road Equipment, announces the appointment of J. Frank Sims as general sales manager. In his new position Mr. Sims will be in charge of all sales activities through dealer organizations.

Mr. Sims, before his association with contractors Machinery Co., spent several years on construction equipment during the reconstruction of the Mississippi River Levee system following the floods of 1927. He joined International Harvester Co. in 1934 and served as district representative in the Southern, Central and Eastern districts. In January 1942, he was assigned to Harvester's Washington office where he handled industrial power equipment with the Army, Navy, Marine Corps and War Production Board. Mr. Sims was made zone manager when International Harvester Co. created the new industrial power equipment division, with headquarters in Richmond, Va., which position he held until joining Contractors Machinery Co.

THE FORMER Concrete Cutting Corp. of America, Brooklyn, N. Y., has changed its name to the Rapid Pavement Breaker Co., and moved to 1517 So. Santa Fe Ave., Los Angeles 21, Calif.

JOHN H. BANNING has been appointed district engineer of the Asphalt Institute for Montana, eastern Washington, Idaho, Wyoming, North Dakota, western South Dakota and Utah, with offices in the Gullard and Wilkins Building, Billings, Mont.

FOUR CHLORINATORS, products of Wallace and Tiernan Co., Newark, N. J., were among the first equipment other than weapons in operation on the bullet-swept beaches of Normandy. Soon after reconnaissance squads of the Engineer Combat Battalion, charged with the mission of purifying water, located a small stream, the Newark-built machinery was at work safeguarding our troops.

FIVE KEY appointments to the executive staff have been made by the Firth-Sterling Steel Co., McKeesport, Pa., as follows:

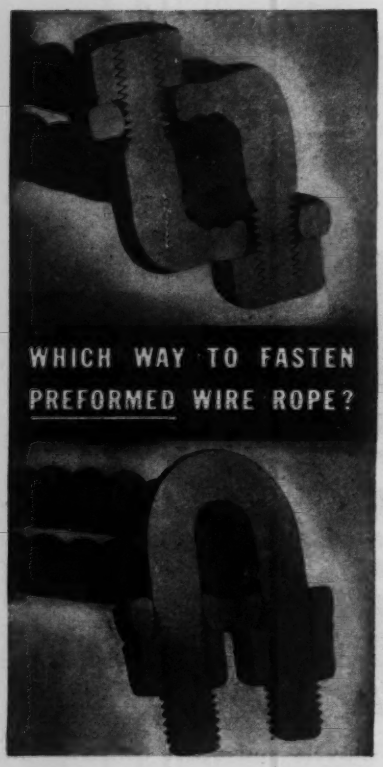
J. P. Larkin is the new chief metallurgical and sales engineer of the steel division. A graduate in metallurgy from Massachusetts Institute of Technology, Mr. Larkin has had broad experience with tool and stainless steels. For two years he served as chief of the tool steel, stainless and lease lend alloy steel sections of the alloy steel branch of the War Production Board in Washington, while on special leave of absence from the Crucible Steel Co.

For assistant manager of its Firthite division, the company selected Andrew H. Godfrey, an engineer who has been closely associated with the tungsten carbide industry. Mr. Godfrey was factory manager of Carboloy Co., Detroit, until the war, when he became production coordinator of the Cleveland Ordnance District, Army Service Forces.

Anthony J. Allen is the new assistant manager of the Firthaloy division. A graduate in metallurgical engineering from North Eastern University, Boston, Mr. Allen has been associated for 15 years in various capacities with the manufacturing end of the wire industry. Thomas W. Gabriel is the new Ohio district sales manager and Lloyd W. Clowes is Pittsburgh district sales manger. Mr. Gabriel majored in civil engineering at Rutgers University, after which he was with the New York office of Carnegie Illinois Steel Corp.

L. W. Clowes, head of the newly created Pittsburgh sales district, is a graduate of Rhode Island State College. A second lieutenant in the Army Air Forces in the first World War, he was with L. S. Starrett Co., manufacturer of precision measuring tools, for 25 years. In 1942 he was given a leave of absence to go with the War Production Board in Washington, where he served as chief of the cutting tools section and chief of the gage and precision tools section of the tools division.

LESS "BEEF" MORE GRAVY
Power shovels and other construction equipment are normally built with a lot of "beef" so they can take the shocks which have long been accepted as part of the day's work. But if you stop to think about it, there's another—and better—answer. Eliminate the shocks and you can eliminate the cost and weight of the extra "beef" . . . and thereby make "gravy" for the man who pays for fuel and upkeep.
When the power train includes a Twin Disc Hydraulic Coupling, there's a cushion of fluid which takes the blows that would otherwise wrack the equipment from end to end. Cables, gears, booms, and buckets —all last longer because the excess strain of a shock load never touches them. Operators last longer, too; it's a lot more comfortable to operate a coupling-equipped job.
Look into the potential savings made possible by a Twin Disc Hydraulic Coupling. Send for a free copy of Bulletin 136 to get the interesting details. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).
ARMY E NAVY
TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
Power Take-off
Hydraulic Torque Converter
Machine Tool Clutch
SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918



The cross-section views show what happens to wire rope. In Fig. 1, Laughlin's "Fist-Grip" Safety Clip holds the 5/8" rope with hardly any distortion (note hemp centers). In Fig. 2, hemp center under U shows how rope is squeezed and flattened by U-bolt's smaller bearing area and "Finger-Pinch". Both were tightened to same tension by torque-indicating wrench.

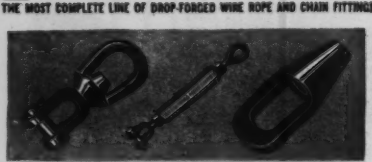
Here's Why "Fist-Grip" Clips Work Better

Laughlin Safety Clips have identical saddles, flat sides; hold rope firmly without crushing. Saddles fit snugly against "live" and "dead" ends. Fewer clips deliver full rope power. The only clips with drop-forged bolts. Test them, for your rope's sake.

Distributed through mill, mine and oil field supply houses. Write for catalog. Dept. 2, The Thomas Laughlin Co., Portland 6, Maine.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



Men and Jobs

Don M. Forester has been appointed project engineer, San Luis Valley Reclamation Project, Monte Vista, Colo., for the Bureau of Reclamation, whose service he entered in 1932. He has worked on Boulder Dam, the All-American Canal, and the Oregon Cooperative Investigations, Medford, Ore.

Starting as assistant engineer he was advanced to engineer in the Denver office. He was appointed chief of reports, Branch of Project Planning, Denver, last May. He was graduated with a B.S. degree from the Georgia School of Technology in 1914. He served from 1917 to 1919 with the Engineering Corps, U. S. Army, with the rank of Captain.

Lieut. Col. John P. Larsen, United States district engineer in Jacksonville, Fla., for the last four years, has succeeded **Col. H. L. Robb** as engineer for the Charleston, S. C., district. Colonel Robb has been given active duty at Camp Claiborne, La., to have charge of training troops for overseas duty. Colonel Larsen served in World War I as an enlisted man and later was commissioned a second lieutenant. He left the Army and was employed as an engineer by the state of New York. He reentered the service in 1940.

Charles S. Keating, consulting engineer of the engineering department of Syracuse, N. Y., is retiring after 23 years. He will be succeeded by **S. Elmer Chambers** of the Farm Security Administration.

Mr. Keating entered municipal employ in 1921 after serving in other New York state cities. Mr. Keating became first deputy city engineer. Subsequently, he was named consulting engineer.

Cecil E. Pearce, chief designing engineer for the $23,000,000 second Nisqually power project of Tacoma, Wash., has resigned as the project is nearing completion.

Appointment of **George C. Rothrock** as chief construction engineer in the Richmond, Va., regional office of the Federal Works Agency, has been announced. Mr. Rothrock, formerly chief engineer examiner in that office, has been on the staff since August, 1943. He succeeds **L. P. Gattis,** who resigned recently to go into private business in Richmond.

E. Warren Bowden, assistant to the president of Walter Kidde Constructors, New York, and **Andrew J. Rinn,** director of budgets of the same firm, have been named vice-presidents of the company. Mr. Rinn has been with the company for 20 years in charge of its estimating work. Mr. Bowden joined the firm two years ago, having been associated previously with the consulting firm of Parsons, Klapp, Brinckerhoff and Douglas, and with the engineering department of the Port of New York Authority.

A. O. Torgeerson has been named acting assistant maintenance engineer of roads and highways in Minnesota. He was formerly district engineer for the state highway department at Detroit Lakes. He is taking over the duties of **J. C. Robbers,** now in military service.

Lt. Charles A. Hines, is stationed with the 89th Division Engineers at Camp Butner, N. C., after having seen action in Italy.

Harry W. Loving, of Charlotte, N. C., for the last three years with the U. S. Engineers, Washington, D. C., has been elected vice-president of the J. A. Jones Construction Co. He will be head of the New York and Washington offices in charge of public utilities and industrial work.

Joseph Leblanc, civil engineer and assistant director of public works at Montreal, Que., is retiring after 34 years service.

Maurice G. Archer, Quebec consulting engineer, overseas for two years, has been promoted to lieutenant colonel in the Canadian army.

Damon Runyan, of Runyan and Slee, engineers of Longmont, Colo., is a line officer with the Seventh Fleet.

Col. Morrill W. Marston, Ames, Ia., has been appointed a brigadier general, and will serve as assistant chief of staff for supply in a Pacific area. General Marston formerly was a student and instructor at the Army Engineers school. He is a graduate of Iowa State College.

Help to Speed Production . . . Lower Costs

OXWELD apparatus includes blowpipes, attachments, regulators, manifolds, cutting machines, acetylene generators, and related equipment and supplies for every application of the oxy-acetylene process. This equipment can be depended on to give efficient, economical service with a minimum of maintenance.

MACHINE APPARATUS

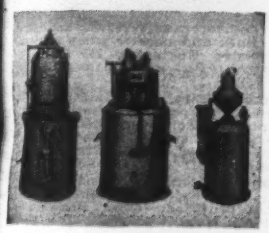
Included in the OXWELD line of apparatus are portable and stationary oxy-acetylene machines for cutting shapes or straight lines; flame-hardening apparatus; bar and billet cut-off machines; automatic welding equipment; and tractor units for plate-edge preparation.

HAND APPARATUS

Oxy-acetylene apparatus which may be ordered from Linde includes oxy-acetylene blowpipes for all welding and heating work; oxy-acetylene cutting blowpipes, cutting attachments, and nozzles; oxy-acetylene descaling and flame-priming equipment. OXWELD apparatus is supplied from Linde offices and warehouses. The PUROX and PREST-O-WELD line, and PREST-O-LITE air-acetylene appliances for soldering and brazing, are distributed by industrial and automotive jobbers.

WELDING RODS AND SUPPLIES

The many kinds and sizes of OXWELD high quality welding rods make it possible to select the one that will give best results on each job. The OXWELD line also includes fluxes, gloves, goggles, lighters, hose, and asbestos paper. Rods and supplies may be ordered from Linde or from automotive and industrial jobbers.



GENERATORS AND MANIFOLDS

OXWELD acetylene generators have maximum generating capacities of from 30 to 9,000 cu. ft. per hour. OXWELD manifolds centralize oxygen and acetylene supply from cylinders.

OXYGEN, ACETYLENE, CARBIDE

A booklet describing use of LINDE oxygen, PREST-O-LITE acetylene, UNION carbide, and OXWELD apparatus in these and other processes will be sent without charge on request. Ask for Form 5268A.

BUY UNITED STATES WAR BONDS AND STAMPS

MARITIME "M" AWARD FOR OUTSTANDING PRODUCTION ACHIEVEMENT

THE LINDE AIR PRODUCTS COMPANY

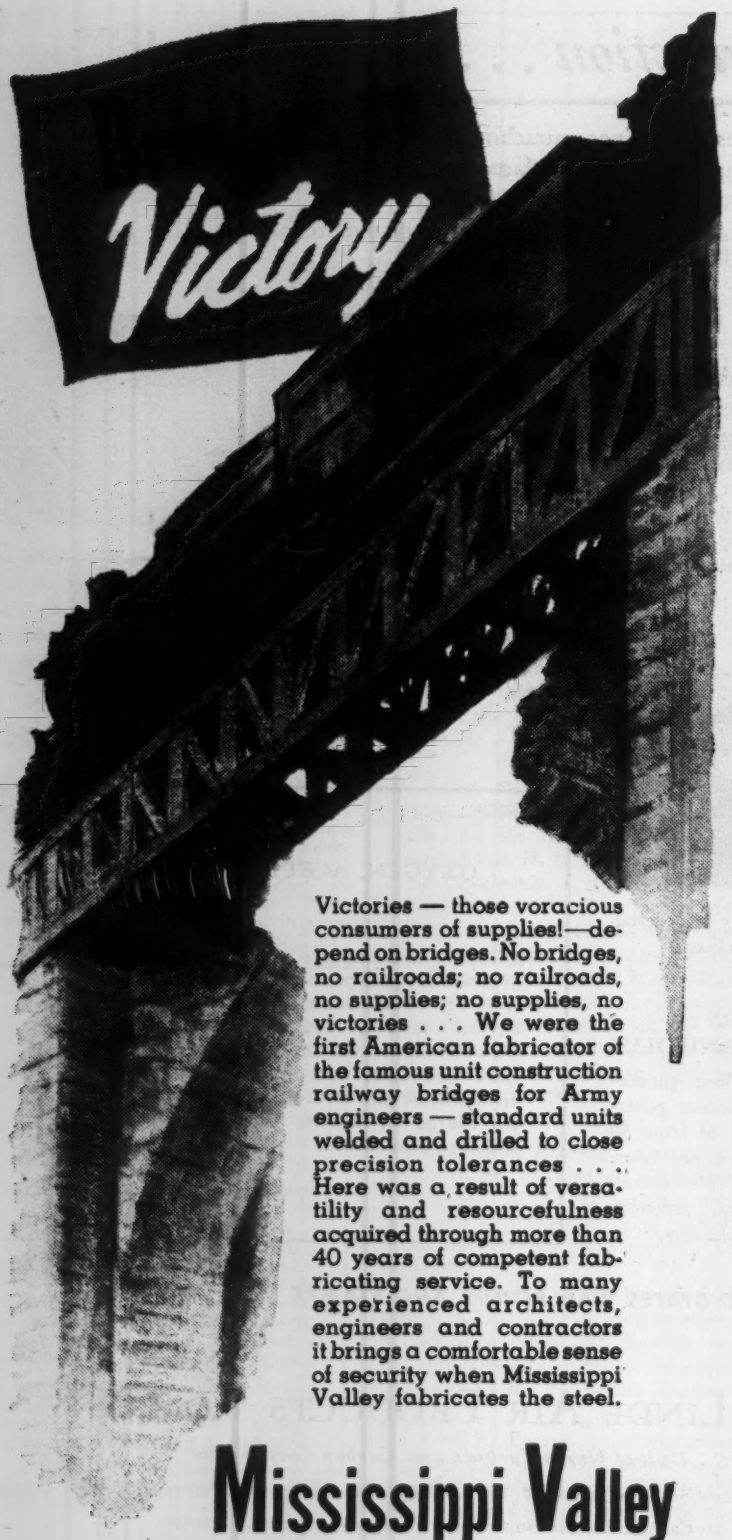
Unit of Union Carbide and Carbon Corporation

30 E. 42nd St., New York 17, N. Y. UCC Offices in other Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

LINDE OXYGEN . . . PREST-O-LITE ACETYLENE . . . UNION CARBIDE
OXWELD, PUROX, PREST-O-WELD, UNIONMELT APPARATUS
OXWELD AND UNIONMELT SUPPLIES

The words "Linde," "Prest-O-Lite," "Union," "Oxweld," "Purox," "Prest-O-Weld," "Haynes Stellite," and "Unionmelt" are trade-marks of Union Carbide and Carbon Corporation or its Units



Victories — those voracious consumers of supplies!—depend on bridges. No bridges, no railroads; no railroads, no supplies; no supplies, no victories . . . We were the first American fabricator of the famous unit construction railway bridges for Army engineers — standard units welded and drilled to close precision tolerances . . . Here was a result of versatility and resourcefulness acquired through more than 40 years of competent fabricating service. To many experienced architects, engineers and contractors it brings a comfortable sense of security when Mississippi Valley fabricates the steel.

Mississippi Valley

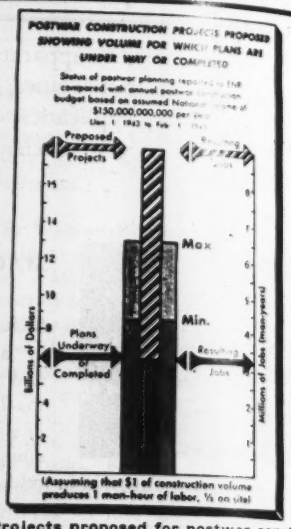
STRUCTURAL STEEL COMPANY

Engineers and Fabricators

DECATUR • ILLINOIS

MELROSE PARK (Chicago Suburb), ILLINOIS • ST. LOUIS, MISSOURI

POSTWAR PROJECTS


POSTWAR CONSTRUCTION PROJECTS PROPOSED
SHOWING VOLUME FOR WHICH PLANS ARE
UNDER WAY OR COMPLETED
Proposed Projects
Max.
Min.
Plans Underway or Completed
Billions of Dollars
Millions of Jobs (man-years)
(Assuming that $1 of construction volume produces 1 man-hour of labor, ½ on site)

Projects proposed for postwar construction have been published in these columns since January, 1943 as they have been reported to ENGINEERING NEWS RECORD.

Statistics based on these reports are used by the Committee on Postwar Construction of the American Society of Civil Engineers to measure the progress of plans for postwar projects.

The chart above shows, both in estimated dollar volume and in jobs or man-years of labor, how fast this reservoir of future work is filling up.

WATER SUPPLY

PROPOSED WORK

★**Mich., Flint**—City, c/o Mayor McLogan, City Hall, water supply reservoir on Flint River, **$1,500,000.**

PLANS UNDER WAY

★**Neb., Lincoln**—City, City Hall, addnl. wells, revision and enlargement well collector piping sys. and treatment plant, constructing addnl. feeder mains. **$500,000.** D. L. Erickson, City Hall, city engr. CD 8/5/43—ENR 8/12/43.

O., Alliance—City, City Hall, plans 80% completed 3 m.g. storage reservoir and pertenent distr. lines and booster pump station. **$225,000.** Chester Engineers, 210 E. Park Way, Pittsburgh, Pa., consult. engrs. CD 8/21—ENR 9/7.

★**O., Columbus**—City, City Hall, plans 5% completed addnl. mains, filtration plant, elevated tanks, replacing and addnl. equip. **$1,000,000.** Legal obstacles to be overcome, financing not provided. P. W. Maetzel, City Hall, city engr. CD 2/19/43—ENR 3/4/43.

O., Fremont—Municipality, Fremont, erecting 1 m.g. water storage tank. **$50,000.** Financing not provided. Chas. Hochenedel, 617 Croghan St., consult. engrs. CD 10/26—ENR 11/16.

O., Ironton—R. Mittendorf, mgr., City Hall, WW intake. **$50,000.** K. R. Wentz, city engr.

★**O., Springfield**—City, City Hall, plans completed reservoir, supply pipe and treatment plant. **$1,250,000.** Land rights not cleared, financing not provided. W. E. Lucas, City Hall, city engr.

★**O., Zanesville**—City, City Hall, water purification and softening sys. **$600,000.** Financing not provided. Chas. P. Hoover, consult. engr., Columbus Water Works, Columbus, made preliminary survey and estimate. H. O. Church, City Hall, city engr.

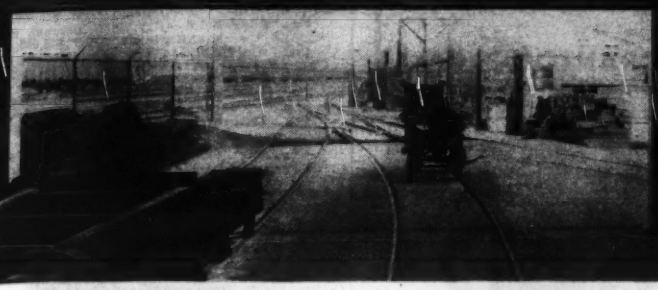
Okla., Bartlesville—City, R. Taylor, mgr., City Hall, plans 5% completed exten., impr. water plant and pump. station. **$394,113.** Financing not provided. Black & Veatch, 4706 Bway., Kansas City, Mo., consult. engrs.

★**Okla., Enid**—City, City Hall, development water supply (wells or lake), approx. 30 mi. supply line and miscellaneous addns. to distr. sys. **$1,900,000.** Archer Engineering Co., 114 W. 10 St., Kansas City, Mo., consult. engrs. L. T. McKee, 120 W. Cherokee Ave., engr.

★**Okla., Tulsa**—City, Municipal Bldg., addnl. impounding reservoir and flow lines for water supply. **$6,000,000-$6,500,000.** Land rights not cleared, financing not provided. W. F. McMurrary, Municipal Bldg., WW engr. W. R. Wooten, Tulsa, asst. city engr. CD 7/10—ENR 7/27.

KINNEAR *Motor Operated* ROLLING DOORS

Another Case Where **KINNEAR** *Advantages Proved to be the Only Answer*



This unusual door installation not only dramatizes the vantages Kinnear Rolling Doors bring to *every* door- y need, but it also illustrates a situation in which Kin- ar Doors were the *only* practical answer. The two doors e close together and at angles to each other, the smaller or in a wall area only slightly wider than the opening elf—no room for swinging, folding, or sliding action— t even for horizontal storage overhead! This called for e space-saving operation of Kinnear Rolling Doors. rising vertically and rolling into a neat coil above the tel, Kinnear Rolling Doors need no space for opera- n. They leave all floor and wall areas clear for mate- ls and machinery, *usable* right up to the lintel at every int. Doorways are cleared from jamb to jamb, from or to lintel! Rugged all-metal interlocking-slat con- ruction, *originated by Kinnear,* ensures an extra measure of protection against intrusion, fire, wind and weather; gives doors a resilience that absorbs blows and shocks. If accidentally damaged, the slats can be individually replaced quickly and economically.

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Kinnear adaptability is widely recognized through thousands of Kinnear installations serving industry everywhere. Every Kinnear Rolling Door is "tailored" to the specific installation. Get full information on Kinnear Rolling Doors and see how these time-saving, money-saving doors will fit into your doorway picture. Write us about your particular doorway problem.

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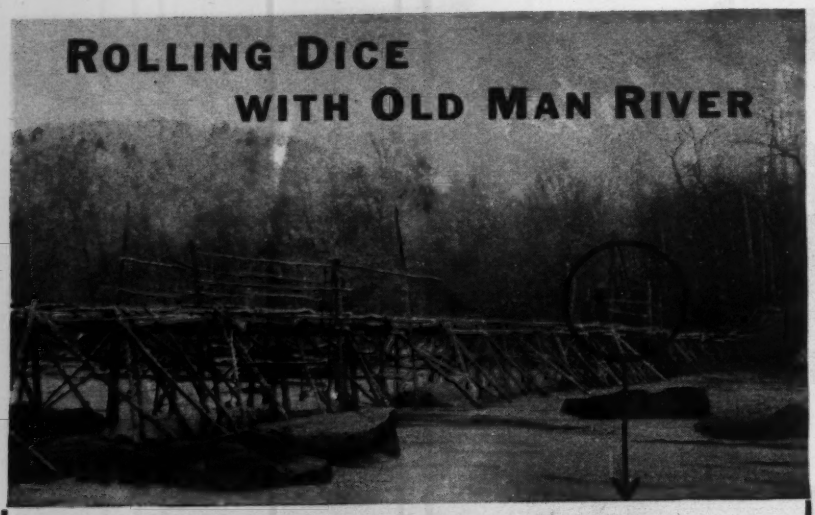

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POSTWAR PROJECTS (Cont'd.)

Pa., Coatesville — City, City Hall, plans 50% completed pipeline and clear water basin, $200,000. Wm. C. Emigh, engr.

Pa., Oil City—City, City Hall, plans 15% completed 24 in. cement-asbestos supply line, $40,000; distribution sys., $50,000. H. S. Weber, City Hall, city engr. CD 4/24—ENR 5/4.

Tex., Pasadena — City, City Hall, plans underway WW imprvs., $60,000. Garrett Engineering Co., 1806 Milam St., Houston, consult. engr. CD 10/2—ENR 11/2 under Water Supply.

Tex., Pharr—City, A. Kelley, mayor, City Hall, plans 25% completed water plant expan., incl. addnl. distr. lines, etc. $45,000. Financing not provided. A. Tamm, 107 S. 1 St., Harlingen, consult. engr. CD 9/12—ENR 9/14, under Water Supply.

★**Ont., Kitchener**—City, City Hall, extens. WW sys. and augmenting water supply from Grand River at Bridgeport. About $600,000. S. Shupe, City Hall, engr.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Ind., Alexandria—City Council, H. E. DeMoss, mayor, City Hall, sewage treatment plant, $150,000. Financing not provided.

Ind., Columbia City—City Council, J. A. Brown, mayor, pres., City Hall, sewage treatment plant, $150,000.

Ind., Rushville—Bd. P. Wks., M. Abercrombie, mayor, chn., City Hall, sewage treatment plant, $200,000. Financing not provided.

Ind., Sheridan—City Council, S. Ricketts, clk., sewage treatment plant, $60,000.

Pa., Alekandria — City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Bedford—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Bellwood—Borough, c/o Borough Secy., sewage treatment facilities. Over $25,000.

Pa., Burnham—City, c/o Borough Secy., sewage treatment facilities. Over $25,000.

Pa., Christiana—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Clearfield—City, c/o Borough Secy., sewage treatment plant. Over $25,000.

Pa., Columbia—City, c/o City Clerk or Council, City Hall, sewage treatment facilities. Over $25,000.

Pa., Curwensville—City, c/o Borough Secy., sewage treatment plant. Over $25,000.

Pa., Dauphin—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Dewart — City, c/o Borough Secy., sewage treatment plant. Over $25,000.

Pa., Duncannon—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Duncansville—Borough, c/o Borough Secy., sewage treatment facilities. Over $25,000.

Pa., Emporium—City, c/o Burgess, sewage treatment plant. Over $25,000.

Pa., Everett—City, c/o Borough Secy., City Hall, sewage treatment facilities. Over $25,000.

Pa., Hughesville—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Jersey Shore—City, c/o Burgess, sewage treatment plant. Over $25,000.

Pa., Lewisburg—City, c/o Borough Secy., sewage treatment plant. Over $25,000.

Pa., Lewiston—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Lock Haven—City, c/o Burgess, sewage treatment plant. Over $25,000.

Pa., Middleburg—City, c/o Borough Secretary, sewage treatment facilities. Over $25,000.

Pa., Middletown—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Mill Hall—City, c/o Borough Secretary, sewage treatment facilities. Over $25,000.

Pa., Milton — City, c/o Burgess, sewage treatment plant. Over $25,000.

Pa., Montgomery—City, c/o Borough Secretary, sewage treatment facilities. Over $25,000.

Pa., Mount Union—Borough, c/o Borough Secy., sewage treatment facilities. Over $25,000.

Pa., Muncy—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., New Cumberland—Borough, c/o Borough Secy., sewage treatment facilities. Over $25,000.

Pa., Newport—Borough, c/o Borough Secy., sewage treatment facilities. Over $25,000.

Pa., Saxton—Borough, c/o Borough Secy., sewage treatment facilities. Over $25,000.

Pa., Selinsgrove—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Spring Grove—Borough, c/o Borough Secy., sewage treatment facilities. Over $25,000.

Pa., Sunbury—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Steelton—City, c/o Burgess, sewage treatment facilities. Over $25,000.

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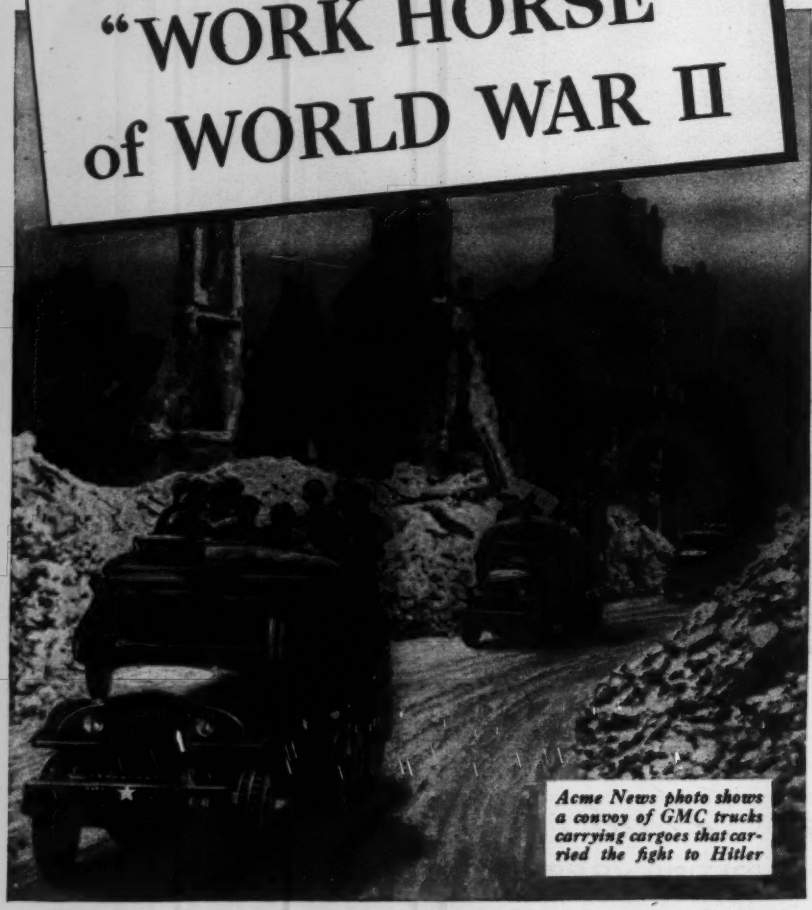

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POSTWAR PROJECTS (Cont'd.)

Pa., Tyrone—City, c/o Burgess, sewage treatment facilities. Over $25,000.

Pa., Watsontown—City, c/o Burgess, sewage treatment plant. Over $25,000.

Pa., Wellsboro —Borough, c/o Borough Secretary, sewage treatment facilities. Over $25,000.

Pa., Williamsport—City, sewage treatment plant. Over $25,000.

Pa., York—City, c/o City Clerk or City Council, City Hall, sewage treatment plant, over $25,000. CD 9/28—ENR 10/19.

PLANS UNDER WAY

Conn., Fairfield—Town, F. S. Shaw, chn., Mill Hill, Southport, plant 80% completed brick, steel, concrete incinerator-garage bldg., Wakeman Island, $300,000. Financing not provided. Heis & Holroyd, 257 Bway., Troy, N. Y., consult. engrs. CD 12/1—ENR 12/14, under Sewers, etc.

★ **Conn., Hartford**—Hartford Metropolitan Dist. Bureau P. Wks., 550 Main St., Hartford, plans under way trunk line sewer, Hartford to Windsor, $250,000; trunk sewer, Willard and Robbins Aves., from West Hartford to Newington, $265,000; sewage disposal plant, in East Hartford $985,000. Financing not provided. R. J. Ross, 550 Main St., Hartford, engr.

Conn., Thomaston—Town, Bd. Selectmen, Town Hall, sewage treatment plant and sanitary sewers. $350,000. Financing not provided. Buck & Buck, 650 Main St., Hartford, consult. engrs.

Conn., Winsted—City, J. W. Darcy, mayor, City Hall, sewage disposal plant, trunk sewer. $325,000. Financing not provided. Buck & Buck, 650 Main St., Hartford, consult. engrs. CD 4/21—ENR 5/4.

Mass., Holyoke — City, Pub. Wks. Dpt., City Hall, plans 50% completed brick, steel, concrete incinerator plant, Main and Berkshire Sts. $275,000. Financing not provided. Keis & Holroyd, 257 Bway., Troy, N. Y., consult. engrs. E. A. Maher, City Hall, city engr. CD 10/11—ENR 11/2.

Minn., Columbia Heights—City, P. T. Olsson, mgr., City Hall, sanitary sewerage sys. $75,000. R. D. Thomas & Associates, 1200 2 Ave. S., Minneapolis, consult. engrs.

Neb., Lincoln—City, City Hall, various rein.-con. storm sewers, $200,000. D. L. Erickson, City Hall, city engr.

N. D., Devils Lake—City, R. A. Young, comr., preliminary survey sewage plant, $30,000. Lium & Burdick, Grand Forks, consult. engrs.

O., Alliance—City, City Hall, plans completed modernizing sewage disposal plant, $235,000. Financing not provided. Chester Engineers, 210 E. Park Way, Pittsburgh, Pa., consult. engrs.; plans 50% completed storm and sanitary sewers, $100,000, W. D. Sponseller, City Hall, city engr. CD 9/21, 8/30—ENR 10/5, 9/21.

O., Cambridge—City, City Hall, preliminary plans completed sewage disposal plant, etc. $275,000. Legal obstacles to be overcome. Financing available. Floyd Browne & Associates, Marion, consult. engrs. P. Sheehan, City Hall, city engr. CD 11/2—ENR 11/16.

O., Cambridge—City, Municipal Bldg., plans completed, 5 ft. diam. storm sewer tunnel. $50,000. Financing not provided. P. Sheehan, Municipal Bldg., city engr.

★ **O., Columbus**—City, City Hall, plans 5% completed enlarging sewage treatment plant, $1,800,000; addnl. incinerators, $250,000; sanitary sewers, $354,000; combined sewers, $1,000,000; storm sewers, $1,500,000. Legal obstacles to be overcome, financing not provided. P. W. Maetzel, City Hall, city engr. CD 9/7/43, 3/11/44—ENR 9/9/43, 8/24/44.

O., Farmdale—Village, plans completed sanitary sewerage sys., sewage treatment plant. $100,000. Legal obstacles to be overcome. A. Bauer, Mutual Home Bldg., Dayton, consult. engr.

O., Fremont—City, City Hall, sewage disposal plant, $150,000, Land rights not cleared, legal obstacles to be overcome, financing not provided, C. H. Shively, 4004 Croghan St., archt.; plans 50% completed trunk storm and sanitary sewer, $140,000. Legal obstacles to be overcome and financing not provided. Chas. Hochenedel, 617 Croghan St., consult. engr.

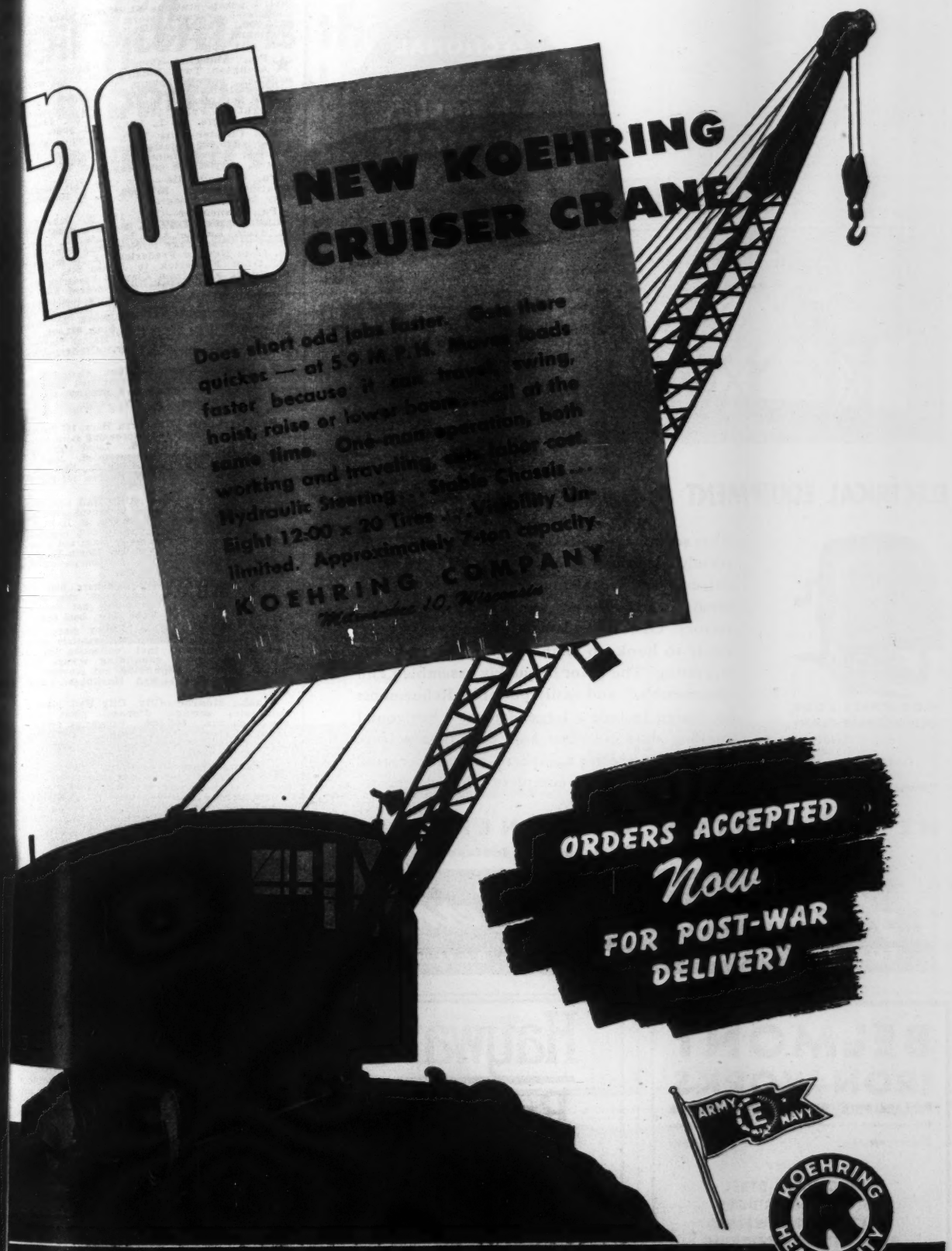
O., Ironton—City, City Hall, treatment plant, $300,000; concrete and vitr. tile storm sanitary and combined sewers, $100,000; renewing present storm and sanitary sewers, etc. $50,000; repairing incinerator, $15,000. K. R. Wentz, city engr.

O., Lancaster—City, City Hall, plans completed storm sewers, Reese Addn. Miller Addn. and Rising Park Addn. $83,000. Financing not provided. W. W. Graf, City Hall, city engr. CD 12/27/43—ENR 1/13/44.

O., Newark—City, Dpt. Pub. Serv., Div. Engineering, sewers, $100,000; Everett Ave. relief sewer, $80,000; Locust St. relief sewer, $80,000. C. H. Wells, City Hall, city engr.

★ **O., Springfield**—City, concrete combined and sanitary sewers, $1,500,000. Jones & Henry, Toledo Trust Bldg., Toledo, consult. engrs. W. E. Lucas, City Hall, city engr.

★ **Okla., Tulsa**—City, Municipal Bldg., plans 2% completed sewage treatment plant and interceptor sewerage sys. (collection),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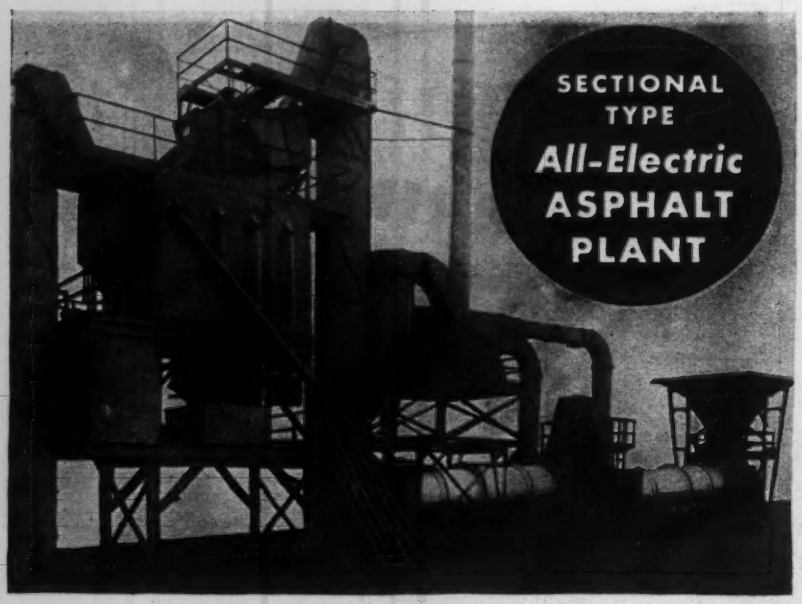

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POSTWAR PROJECTS (Cont'd.)

incl. 5 pump. stations, $30,000; Plans 50% completed various st... sewer projects. $315,000. Funds availa... D. W. Patton, Municipal Bldg., city e... W. R. Wooten, asst. city engr.

★ **Pa., Abington**—Com... Abington Twp. Bldg... plans under way, sanitary sewers, pump... plant, treatment plant and incinerator pl... $1,000,000. Land rights not cleared, finan... not provided. Abright & Friel, 1520 ...ust St., Phila., consult. engrs. O. L. K... twp. engr.

Pa., Chester—City Ha... rebuilding 9 St. sewer, $20,000; outlet ..., Jeffrey St., $10,000; corner basins, $6...00. F. G. Hartvigson, City Hall, city e...

Pa., Connellsville—City... ty Hall, sewage treatment plant. $375,000. ... J. E. Hoenshel, City Hall, city engr.

Pa., Lancaster—City, ... N. Duke St., plans completed 60 in. storm sewers, Clay St. from Landis Ave. to State St., 48 in. State St. from Clay to New Sts., 36 in. State St. from New to Frederick Sts., 30 in. State St. from Frederick to James Sts., 36 in. President Ave. from Clay to Frederick Sts., $50,000. Land rights not ...leared and financing not provided; repla...g combination sewers, 48 in., Andrew St. from Mill to Strawberry Sts., 36 in. North St. from Strawberry to Rockland Sts., $32,000. Financing not provided. J. Haines Shertzer, 120 N. Duke St., city engr. CD 10/2—ENR 10/19.

Pa., Mount Carmel—Mount Carmel Boro, City Hall, plans 50% completed combined storm and sanitary sewers, $200,000. Financing not provided. H. W. Jones, 326 South Oak St., engr.

Pa., Narberth—Narberth Boro, 107 Forrest Ave., plans completed increasing storm water sewerage sys. $117,736. Land rights not cleared, financing not provided. John M. Irvine Associates, 315 S. 15 St., Phila. Pa., consult. engrs. Geo. B. Suplee, 107 Forrest Ave., engr.

★ **Pa., Oil City**—City, City Hall, plans 75% completed rein.-con. intercepting sewers, some storm sewers, $200,000. R. B. Weber, City Hall, city engr.; plans 50% completed primary sewage treatment plant and 2 sewage pump. stations, $300,000, Morris Knowles, Inc., 1312 Park Bldg., Pittsburgh, consult. engr. CD 4/20—ENR 5/4.

Pa., Wilkinsburg—Wilkinsburg Boro, 605 Ross Ave., plans completed vitr. storm sewers, $142,000. Financing not provided. C. F. Sperling, 605 Ross Ave., boro engr.

Tex., Pharr—City, A. Kelley, mayor, City Hall, plans 25% completed sanitary sewerage sys. imprvs., incl. collection line repairs, new lines, rebuilding sewage distr. plant, $65,000. Financing not provided. A. Tamm, 107 S. 1 St., Harlingen, consult. engr.

Wash., Monroe—City, City Hall, plans incomplete, sewage disposal plant, exten. sewerage sys. $65,000. Financing provided. J. W. Corey, Arctic Bldg., 2 and Cherry Sts., Seattle, Zone 4, consult. engrs. CD 9/7—ENR 9/21.

★ **Wash., Vancouver**—City, City Hall, F. Sinclair, mayor, plans under way, complete city sewerage sys. with treating plant, storm drains and sanitary lines, $3,000,000. Financing not provided. Stevens & Koon, Spalding Bldg., Portland, Ore., consult. engrs. M. Ray, City Hall, city engr. CD 1/25/43, 10/20/43, 1/12/45—ENR 1/28/43, 10/28/43, 1/25/45.

★ **Ont., Kitchener**—City, City Hall, Spring Valley Sewer Plant addn., about $400,000; incinerator, about $100,000. S. Shupe, City Hall, engr.

READY FOR BIDS

O., Newark—City, Dpt. Pub. Serv., Div. Engineering, plans completed Holler Ditch trunk sewers, $150,000. C. H. Wells, City Hall, city engr. CD 8/11—ENR 8/24.

O., Xenia—City, G. D. Ackerman, mgr., City Hall, plans completed brick, concrete incinerator. $42,000. R. T. Parish, 942-945 U.B. Bldg., Dayton, consult. engr. CD 1/13.

O., Xenia—City G. D. Ackermen, mgr., City Hall, plans completed sewage treatment plant addn. $100,000. R. T. Parris, 942-945 U.B. Bldg., Dayton, consult. engr. CD 11/30—ENR 12/14.

Pa., Canonsburg—Borough, plans completed paving, grading streets, $97,700. D. H. Abrams, 68 East Pike St., borough engr.

Pa., Ellwood City—Borough of Ellwood City, 525 Lawrence Ave., plans completed enlarging, remodeling sewage treatment plant. $75,000. Chester Engineers, 210 Park Way at Sandusky, Pittsburgh, consult. engrs.

Tex., Taylor—City, City Hall, plans completed incinerator. $35,000. Financing provided. H. C. Richards, City Hall, engr.

BRIDGES

PROPOSED WORK

D. C., Wash.—District Comrs., District Bldg., Klingle Rd. Bridge. $450,000.

Washington—State Hy. Dpt., C. Hickey, dir., Olympia, by-pass from Ellis St. to Girard St., Bellingham, Whatcom Co. Over $25,000.

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THINK! Why is it that every metal bearing surface in every motor in every truck or bus you maintain would *seize* if it were not protected by oil film?

How is it that an almost inconceivably thin film of oil can withstand conditions of heat, pressure and sliding friction that no metal can endure? Not even scientists have the complete answer. But you service men know that good oil does mean everything to motor life—motor oil that can be depended on for efficient and lasting lubrication.

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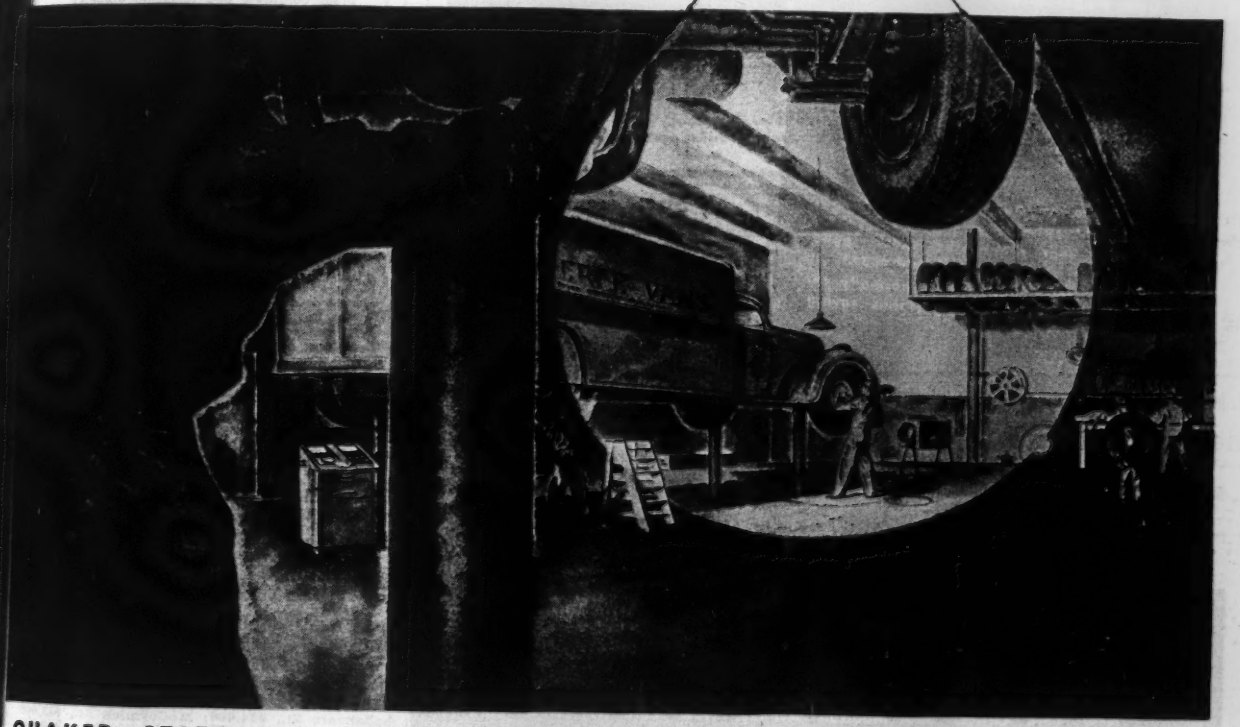

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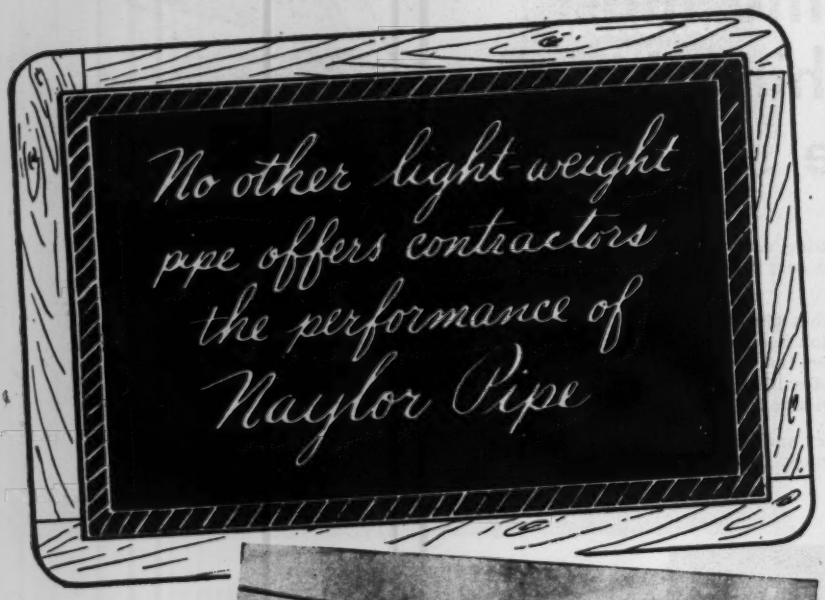

INSTALLATION

Light weight simplifies handling, makes Naylor easier to install.

Lockseam Spiralweld structure holds true cylindrical form.

Accurate diameter and concentric ends speed assembly.

Advanced-type coupling methods cut installation time.

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Exclusive structure produces stronger, leaktight, safer pipe.

Safety feature absorbs shock loads, vibration, expansion and contraction.

Naylor Pipe handles jobs normally requiring heavier-wall pipe, thus saving steel.

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Light weight cuts shipping and handling costs.

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Sizes from 4" to 30" in diameter. Thickness from 14 to 8 gauge. Lengths up to 40 feet. All types of fittings, connections and fabrication.

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New York Office: 350 Madison Avenue, New York 17, New York

POSTWAR PROJECTS (Cont'd.)

PLANS UNDER WAY

Me., Lewiston—City, [illegible] Wks. Bd., City Hall, plans completed [illegible] ft. 21 ft. span, rigid frame, rein.-con. bridge, flat concrete slab fdn. **$42,000.** Legal obstacles to be overcome. L. E. St. Pierre, 69 Park St., engr.

Mich., Mason—Ingham County Rd. Comm., Mason City, plans 90% completed grade separation, **$187,000.** Land rights not cleared, legal obstacles to be overcome, financing not provided. G. Foster, Lansing, consult. engr. E. Ferris, Mason, co. engr. CD 10/25—ENR 11/16.

★ **Ohio**—State Hy. Dpt., Columbus, bridge replacement at Spring Common, Youngstown, Mahoning Co., **$900,000.** Wilbur Watland, consult. engrs.

★ **O., Columbus**—City, City Hall, plans 1st completed Third St. viaduct, **$2,000,000**; bridge at Whittier St. of C. & O. R. R., **$200,000**; grade crossings at Mound, Hudson Sts., Hague, Oakland, Park Sts., Windsor Pl., Genesee, Denune Aves., and Cooke, Rathbone, Weber, Westerville Rds., **$1,500,000.** Legal obstacles to be overcome and financing not provided. P. W. Maetzel, City Hall, city engr. CD 9/7/43—ENR 9/9/43.

O., Ironton—City, City Hall, plans [illegible] completed rein.-con. underpass, N. & W. R. R. Est. **$25,000.** K. G. Wentz, city engr. N. & W. R. R. Engineering Dpt., engr.

O., Springfield—City, City Hall, grade separation, etc. **$350,000.** Land rights not cleared. W. E. Lucas, City Hall, city engr. CD 8/30—ENR 9/21.

★ **Pa., Chester**—City, City Hall, eliminating grade crossing, B.&O. tracks, through city, **$1,750,000**; tracks depressed, **$3,000,000.** F. G. Hartvigson, City Hall, city engr.

★ **Pa., Reading**—Berks Co., Court House, 18 bridges, various sections county, **$1,383,400.** Financing not provided. W. C. Fry, Jr., Court House, co. engr.

READY FOR BIDS

Ia., Cherokee — Cherokee Co., Cherokee, plans completed 3 span 20x150 ft., continuous I-beam, concrete superstructure bridge and one 20x60 ft., low truss span bridge, rein.-con. abutments, **$30,000.** W. T. Hosmer, Cherokee, co. engr.

Okla., Guthrie—Logan Co., Court House, plans completed two 50 ft. I-Beam approaches, 100 ft. steel truss bridge, concrete piling, floor, **$30,000**; two 40-ft. I-Beam approaches, 100 ft. steel truss bridge, concrete piling and floor, **$25,000.** S. E. Ewing, Court House, engr.

Ready for Bids

Of $17,000,000,000 of proposed postwar construction at beginning of 1945 only $500,000,000 was reported "ready for bids", plans complete and financing available.

If you have projects "ready for bids", please send them in to be added to the total above to give a measure of the materials that will be needed to relax restrictions and go ahead with civilian work.

Send ready-for-bids projects news to Elsie Eaves, Manager, Business News Department, Engineering News-Record, 330 W. 42 St., New York 18, N. Y.

STREETS AND ROADS

PROPOSED WORK

★ **Md., Baltimore**—City, City Hall, plans new highway through city. **$10,000,000.** bonds voted. CD 12/27—ENR 1/11.

★ **Washington**—State Hy. Dpt., Olympia, Primary State Hy. 13 from Raymond to Tokeland, **$1,500,000.** C. Hickey, state hy. dir.

Washington—State Hy. Dpt., C. Hickey, dir., Olympia, highway from Marblemount to junction with Primary State Hy. 10, Skagit and Okanogan Counties. **$100,000.**

PLANS UNDER WAY

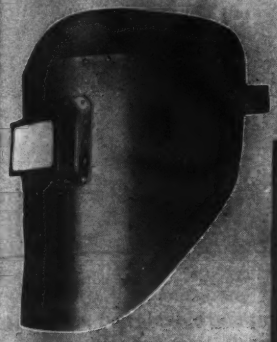
★ **Ga., Decatur** — DeKalb Co., Decatur, voted bonds, plant mix asphalt on stone paving, 200 mi roads, **$1,000,000.** E. W. Wier, Court House, engr.

Ia., Cherokee — Cherokee Co., Cherokee, plans completed 11 mi. grading, gravel surfacing, bridging (concrete culverts), **$45,000**, land rights not cleared; plans 25% completed, approx. 50 mi. grading involving earth excav., pipe and rein.-con. culverts on local county road sys., **$100,000.** W. T. Hosmer, co. engr.

★ **Kan., Wichita**—Dpt. Service, City Hall, plans under way impry. Water St., **$33,000**; English St., **$25,000**; Douglas St., **$140,800**; 2 St., **$36,000**; Central St., **$219,600**; Murdock St., **$74,500**; 13 St., **$104,800**; 17 St., **$100,000**; 18 St., **$25,000**; 21 St., **$33,000**; Wheeler St., **$18,000**; Orient Blvd., **$35,000**; Lincoln St., **$24,000**; McCormick St., **$12,000**; Maple St., **$41,000**; McLean Rd., **$50,000**; Meridian St., **$110,000**; Seneca St., **$18,500**;

POPULAR WELDING HELMETS

Five Styles—All Sizes



These quality arc welding helmets afford a wide range of selection to meet individual preferences, as follows:

No. 45-A: Strong and leakproof, weighing only 15 oz. without lens. Made of best grade, non-warping, black vulcanized fibre. Adjustable chin rest, free-floating wide range headgear.

No. 80-A LIFT-FRONT HELMET: Same as No. 45-A, except that it has a lift-front glass holder. Operator may observe work without lifting helmet. Space is provided for extra clear glass. Weight, about 21 oz. without lens.

No. 25-A: Compact, form fitting, and well ventilated. Especially designed for close-quarter use. Made of best grade, non-warping, black vulcanized fibre. Adjustable chin rest, free floating wide range headgear. Weight, 16 oz. without lens.

No. 70: A lower-priced helmet that is serviceable, well-made, and leakproof. Made of good quality, non-warping, black vulcanized fibre. Adjustable headgear and chin rest. Weight, 14 oz. without lens.

No. 66: A moderately priced, leakproof helmet. Leather sweatband, sliding type adjustable headgear. Streamlined design makes it ideal in close quarters. Weight, about 19 oz. without lens.

**Prices do not include colored plate and cover plate. Prices given above are subject to discount in lots of 12 or more.*

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A Thor Team That Can Do a Better Job

Thor SUMP PUMP

Thor automatically lubricated sump pumps are designed and manufactured to operate most efficiently on the toughest jobs under the most severe, most unfavorable conditions. The Thor rotary air motor is enclosed in an air-tight, fool proof housing to assure steady operation whether partially or fully submerged. Because they are self-priming, centrifugal impeller type pumps. Thor sump pumps will operate in the dirtiest of water—in oil—in sludge or in sewerage, at peak efficiency. The variable speed throttle controls capacity and speed.

Thor Sump Pumps have a newly designed exhaust outlet feature which eliminates, (or in damp climate minimizes), shut-downs due to freezing.

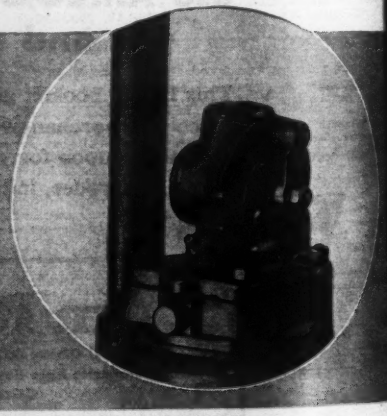
The exclusive Thor automatic lubrication system keeps all moving parts adequately lubricated at all times. For the best in sump pumps call your nearby Thor distributor today.

AUTOMATIC LUBRICATION

Live air pressure provides continuous application of grease to the impeller hub and bushing. The oil is fed from a built-in oil reservoir to the rotor blades and the cyclinder bushings in a fine continuous spray.

VARIABLE SPEED CONTROL

The Thor variable speed throttle accurately controls the speed and capacity of the pump. This is a hand lever that can be set to pump many gallons per minute, or to idling speed where it pumps slowly.



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Branches in Principal Cities

Will Help Contractors Job Easier!

Thor PAVING BREAKERS

The reason for the great popularity of Thor Paving Breakers among contractors and builders is the exclusive Thor "measured air" feature which provides more power, longer life and less operating cost—in short, more work done faster and cheaper. Designed to provide the easy handling that gets tough jobs done quicker, Thor Paving Breakers are built from alloy-steel drop forgings. They have the strength, rigidity and balance, plus maximum power to do the tough jobs in minimum time with the least effort.

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Model 25
Super heavy duty—84 pound—extremely powerful—for the hardest kind of heavy duty work under all conditions.

Model 23
Medium duty—59 pounds—exceptional for cutting walls, floors, and street openings. A hard hitting easy handling machine.

Model 17
Light duty—32 pounds—easily handled machine for general light demolition, breaking concrete floors, tearing down walls and similar applications.

WHAT THOR "MEASURED AIR" MEANS TO YOU

1 Balanced Power—because only a precisely governed quantity of air is allowed behind the piston.

2 Smooth Performance—because every stroke is powered by the same measured quantity of air.

3 Air Economy—because every ounce of air which enters the machine provides a full measure of maximum power for peak efficiency performance.

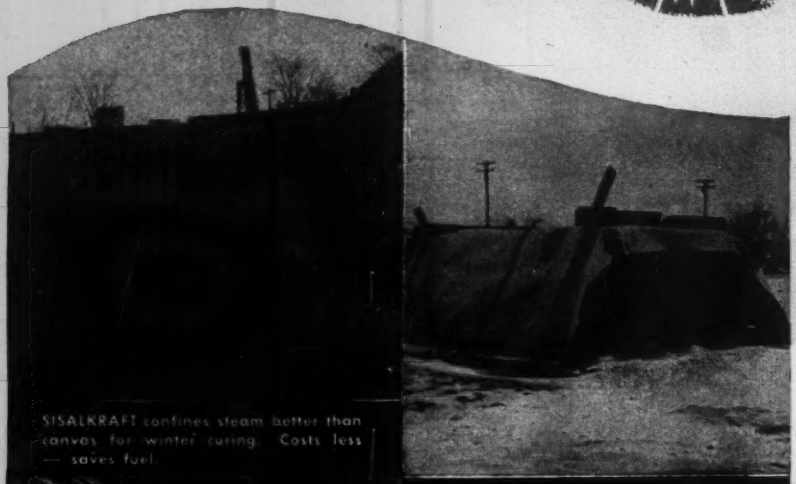
4 Low Maintenance Cost—because there are no separate parts of the patented Thor valve to become lost or wear out.

For more detailed information about powerful, easy operating Thor Paving Breakers and complete line of Thor contractor air tools write or wire for catalog 42-A.

How THOR "measured air" economy works—

The shorter the travel, the more positive the action of the valve in admitting to the tool only the required amount of air—in instantly sealing the inlet against excess air.

Short-travel of the Thor Paving Breaker Valve action powers each stroke of the tool with the same quantity of air. Elimination of excess air keeps out of the channel the overload of power that staggers the stroke and causes vibration.



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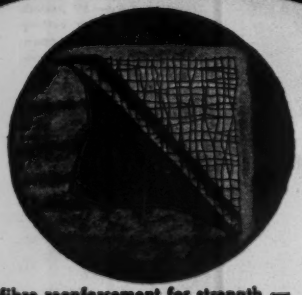
Materials stored in the open are protected from weather when covered with SISALKRAFT.

This is a SISALKRAFT-enclosed job that withstood a heavy gale.

Cover window openings with SISALKRAFT. It won't rip easily or ravel and can be used again and again.



Sisal fibre reenforcement for strength — special asphalt for waterproofness — kraft paper treated to make it scuff-proof — sealed by heat and pressure — to produce SISALKRAFT.

USE windproof SISALKRAFT for every cover-up job — to shut out the weather and hold in the heat. And don't forget to cure and protect all concrete with time-tested SISALKRAFT.

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POSTWAR PROJECTS (Cont'd.)

Syracuse St., $16,000; Water St., $32,000; Waco St., $23,000; Market St., $55,000; Main St., $54,000; Bway., $29,000; Topeka St., $143,000; St. Francis St., $99,000; Hydraulic St., $149,500; Grove St., $33,500; Hydraulic St., $31,000; Oliver St., $50,000; Hillside St., $10,000; Rutan St., $10,000; McLean Blvd., $6,000; Perry St., $5,000; Fountain St., $8,000; Rock Island St., $23,000; Fairmount St., $40,000; Chautauqua St., $7,000; Cleveland St., $7,000; Park Place, $10,000; Ellis St., $8,000; Emporia St., $141,000. Financing not provided. P. L. Brockway, city engr. and dir. service.

★**Neb., Lincoln**—City, City Hall, street pavement incl. grading, curb and guttering, paving base and wearing surface, $700,000. D. L. Erickson, City Hall, city engr.

North Carolina — State Hy. & P. Wks. Comn., Raleigh, constructing State Hy. 181, north of Morganton, Burke Co. $137,000. Funds allotted. W. V. Bone, state hy. engr.

O., Alliance—City, City Hall, plans 10% completed grading, draining, curbing, paving. $100,000. Financing not provided. W. D. Sponseller, City Hall, city engr.

O., Cambridge—City, c/o Municipal Bldg., plans 70% completed, paving city streets, $75,000-$100,000. Land rights not cleared, legal obstacles to be overcome, financing not provided.

★**O., Columbus**—City, City Hall, plans 5% completed paving, widening 25 streets, $2,000,000; sidewalks, $20,000. Legal obstacles to be overcome, financing not provided. P. W. Maetzel, City Hall, city engr. CD 9/7/43—ENR 9/9/43.

O., Cuyahoga Falls—City, City Hall, Zone 1, plans completed paving and storm sewers, $95,000. Financing not provided. T. H. Sauter, City Hall, Zone 1, city engr.

O., Fremont—City, City Hall, plans completed bituminous macadam paving and curbing, $75,000. Financing not provided. Chas. Hochenedel, 617 Croghan St., consult. engr.

O., Ironton—City, City Hall, 4 mi. rein.-con. pavement, $250,000; street resurfacing (T-35), $50,000; plans 40% completed 1¼ mi. traffic bound auxiliary flood route, $30,000. K. R. Wentz, city engr.

★**O., Springfield**—City, City Hall, plans 15% completed asphalt, concrete, brick, curb and gutters, $500,000. Financing not provided. W. E. Lucas, City Hall, city engr. CD 8/31—ENR 9/21.

Pa., Beaver Falls—City, City Hall, plans 80% completed street paving, incl. curbing and 1 small bridge; sanitary and storm sewers in connection with street paving and at other locations where needed, $400,000. Financing not provided. D. F. Harvey, Municipal Bldg., city engr.

★**Pa., Chester**—City, City Hall, exten. 12 St., grading, paving, $300,000; repaving 20 mi. city streets, $1,600,000; new radius corners, $33,000; paving 6 mi. alleys, $100,000; W. 7 St., $60,000; exten. 12 St., incl. bridge, $300,000; widening, paving Edgmont Ave., $15,000. F. G. Hartvigson, City Hall, city engr.

Pa., Coatesville—City, plans 90% completed building or repairing bituminous wearing courses, $50,000. Wm. C. Emigh, engr.

Pa., Edgewood (br. Pittsburgh)—Edgewood Boro, Pittsburgh, Zone 18, plans 90% completed bituminous resurfacing streets, alley paving, concrete, $50,000. E. O. Garrett, Municipal Bldg., Edgewood, Pittsburgh, Zone 18, engr.

Pa., Mount Carmel—Mount Carmel Boro, City Hall, plans 75% completed low cost bituminous pavement. $250,000. Financing not provided. H. W. Jones, 326 S. Oak St., engr.

★**Pa., Oil City**—City, City Hall, plans 30% completed grading, stabilized base, bituminous concrete surfacing together with concrete curb and gutter, $250,000, B. B. Weber, City Hall, city engr.; ¾ million cu. yd. fill, moving 350 ft. highway truss span, constructing bridge over railroad, constructing traffic circle with connections to several streets, pedestrian underpasses, etc. $750,000. Morris Knowles, Inc., 1312 Park Bldg., Pittsburgh, Pa., consult. engr. CD 4/20—ENR 5/4.

Pa., Wilkinsburg—Wilkinsburg Boro, 605 Ross Ave., plans completed colpravia resurfacing concrete streets and alleys. $300,000. Financing not provided. C. F. Sperling, 605 Ross Ave., boro engr.

Tex., Laredo—Webb Co., M. J. Raymund, judge, plans 25% completed asphalt paving, imprv., etc., road work. $300,000 bonds voted. E. J. Foster, 1010 Rosario, P. O. Box 694, co. engr.

READY FOR BIDS

★**Fla., Jacksonville**—City, City Hall, plans completed imprvs. section Edison Ave., $215,000; Atlantic Blvd., $65,240; Orange and Laura Sts., $56,920; Julia St., $104,800; 2 sections Hubbard St., $141,945; Church St., $129,970; Herschell St., $197,980; Oak St., $114,820; Riverside Ave., $120,140; 2 sections Duval St., $86,400; 2 sections Monroe St., $86,400; 2 sections 8 St., $84,550; Post and Lomax St. and Edison Ave., $75,630; Magnolia St., $195,000; 2 sections 16 St., $90,000; sections Laura St., $105,000; Miami Rd., on South Side, $80,000; Edgewood Ave., $131,000; Oak St., $179,500; misc. street sections, $47,000. Fi-

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THE BUCKEYE feed roll, which is spirally fluted and transmission-driven, spreads material to an exact line and at uniform depth mile after mile. Each revolution of the roll deposits an accurately measured amount of material exactly where it is wanted. There are no edges to clean up or uneven spots to smooth out. The machine operates equally as well forward or backward, at any speed. When the spreader is stopped for any reason, the flow of material to the last dribble automatically stops without closing of gates or other manual control. Users in all sections of the country report 20% and more savings in material and 98-99% accuracy on many jobs. Buckeye Spreaders handle all materials, spreading them with the same accuracy whether as a fine trickle of sand or an inch and a half layer of crushed stone.

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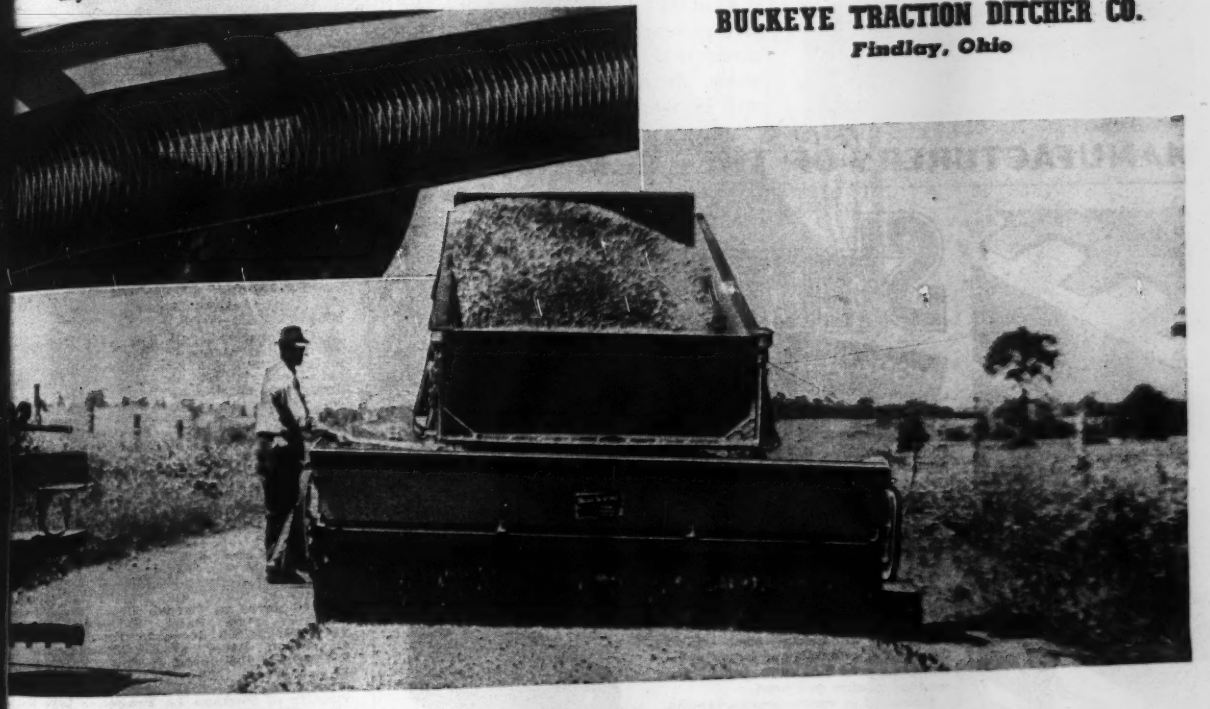

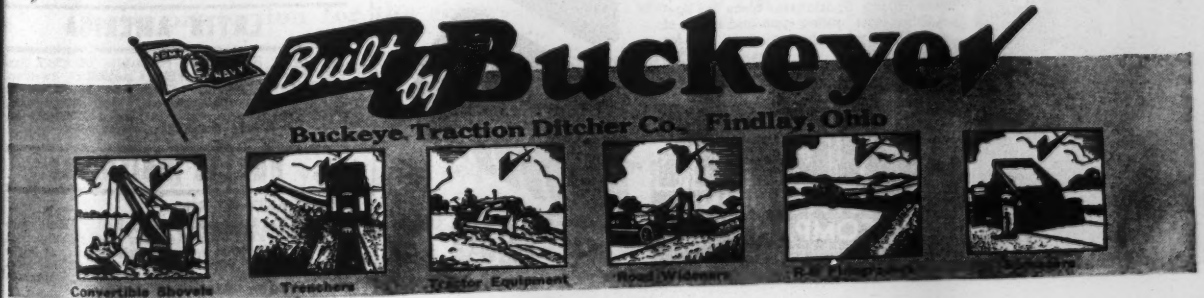

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DAM REPAIRED WITH "GUNITE"

The two photographs show the Bulls Bridge Dam of the Connecticut Light and Power Company which we recently repaired with reinforced "GUNITE." The upper view shows the work in progress and gives some idea of the condition of this structure before repairs were made. The lower view is of the completed job. This is one of the many similar structures which we have repaired for the Connecticut Light and Power Company and others.

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For any type or make of machine—Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls, Snow Plows. Also—CUTTING EDGES, WEARING BOOTS, BACK SLOPERS, EXTENSION BLADES, MOLDBOARDS and SCARIFIER TEETH

50 years of specializing in the manufacture of Construction Equipment Blades has developed for your benefit a quality of special steel, milled through our own rolls and forged at the edges to give that extra cutting and wearing quality you need.

Furnished in various widths, lengths, and thicknesses, punched ready to fit your machine.

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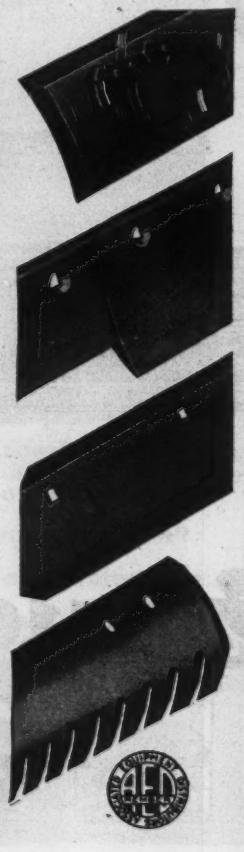


Shunk

MANUFACTURING COMPANY

Established 1854

BUCYRUS, OHIO

POSTWAR PROJECTS (Cont'd.)

nancing provided. W. E. Shedden, Engineers Bldg., engr.

★**Fla., Jacksonville**—City, City Hall, plans completed imprv. large section Riverside Ave., $200,000; sections of Pearl St., $225,000; Park St., $165,000; Forest St. incl. some widening, $80,000; Liberty St., $90,000; Margaret St., $44,250; Stockton St., $60,000; Ashley St., $47,500; 21 St., $155,000; Myrtle Ave., $239,000; miscellaneous streets, $100,000; 2 sections Market St., $143,780, and Park St., $120,000; 3 sections College St., $66,250. Funds available. W. E. Shedden, Engineers Bldg., engr.

Pa., Canonsburg—Borough, plans completed exten. sanitary sewers, $30,000. D. H. Abrams, 68 East Pike St., borough engr.

Tex., Kilgore—Town, plans completed permanent asphalt paving and bridge, $150,000. Funds available. A. P. Norgen, City Hall, engr. CD 4/26—ENR 5/4.

★**Washington**—State Hy. Dpt., Olympia, plans completed widening, realignment 41 mi. highway between Snohomish and Cavelero's Corners, $245,000; widening, realignment Stevens Pass Highway, $331,000. Funds available. C. Hickey, state hy. dir.

EARTHWORK, WATERWAYS

PROPOSED WORK

★†**California**—U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 14, constructing Carbon Creek Flood Control Dam and Basin, San Bernardino Co. $1,600,000.

Ont., Belleville—Dominion Govt., Ottawa, Ont., plans waterfront and harbor imprv. $70,000.

PLANS UNDER WAY

★†**California**—U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 14, plans underway Los Angeles River Channel from Tujunga Wash junction to Sepulveda Dam, $5,135,000; concrete channel in Tujunga Wash from Hansen Dam to Los Angeles River, $7,488,000; Los Angeles River channel from Niagara St. to Lankershim Blvd., $2,002,000; Los Angeles River Channel from Lankershim Blvd. to Tujunga Wash junction, $2,561,000; imprv. San Gabriel River Channel from Santa Fe Dam to Walnut Creek, $2,087,000; plans imprv. Los Angeles River Channel from Southern Ave. (Stewart & Gray Rd.) to Pacific Electric Railway Santa Ana Line, $5,610,000; Upper Burbank Channel, $3,800,000; Upper Los Angeles River channel from Sepulveda Reservoir to Owensmouth Ave., $4,640,000; Whittier Narrows Dam and flood control basin, $13,887,000, all foregoing in Los Angeles Co.; San Antonio Flood Control dam and basin, Los Angeles and San Bernardino Counties, $5,600,000.

Tex., Port Neches—City, City Hall, plans 10% completed drainage, concrete and asphalt paving, $90,000. J. B. Converse & Co., Port Arthur, consult. engrs.

READY FOR BIDS

★**California**—U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 14, plans completed completion Los Angeles River Channel from Bway. to Aliso St., $1,441,000; dredging 40 ft. anchorage areas in Los Angeles Outer Harbor, $1,023,000; completing Los Angeles Harbor, Long Beach Harbor detached breawater, $7,500,000; Santa Fe Dam, incl. channel from mouth of San Gabriel Canyon to Santa Fe Dam near Azusa, $2,000,000, all foregoing in Los Angeles Co.; completing Burbank Western Channel under Southern Pacific R.R. in Burbank, $232,000.

★**Manitoba**—Province of Manitoba, c/o Ministry of Mines & Resources, Winnipeg, plans completed drainage marsh areas of Saskatchewan River, Delta, Portage La-Prairie District, $600,000; 77,000 acres in vicinity of Slater and Pine River, $120,000; 110,000 acres in Catfish Creek areas, southwest of Pine Falls, Springfield District, $177,000; 34,000 acres in Townships 40 and 41, Birch River area, Churchill District, $57,000; 17,000 acres in Township 37, Range 24, Renwer, Churchill District, $25,000; erecting dykes, excav. diversion channel from vicinity of Portage La Prairie to Lake Manitoba, $150,000; constructing dams for headwater storage on reaches of river above St. Lazare, Marquette District, $500,000.

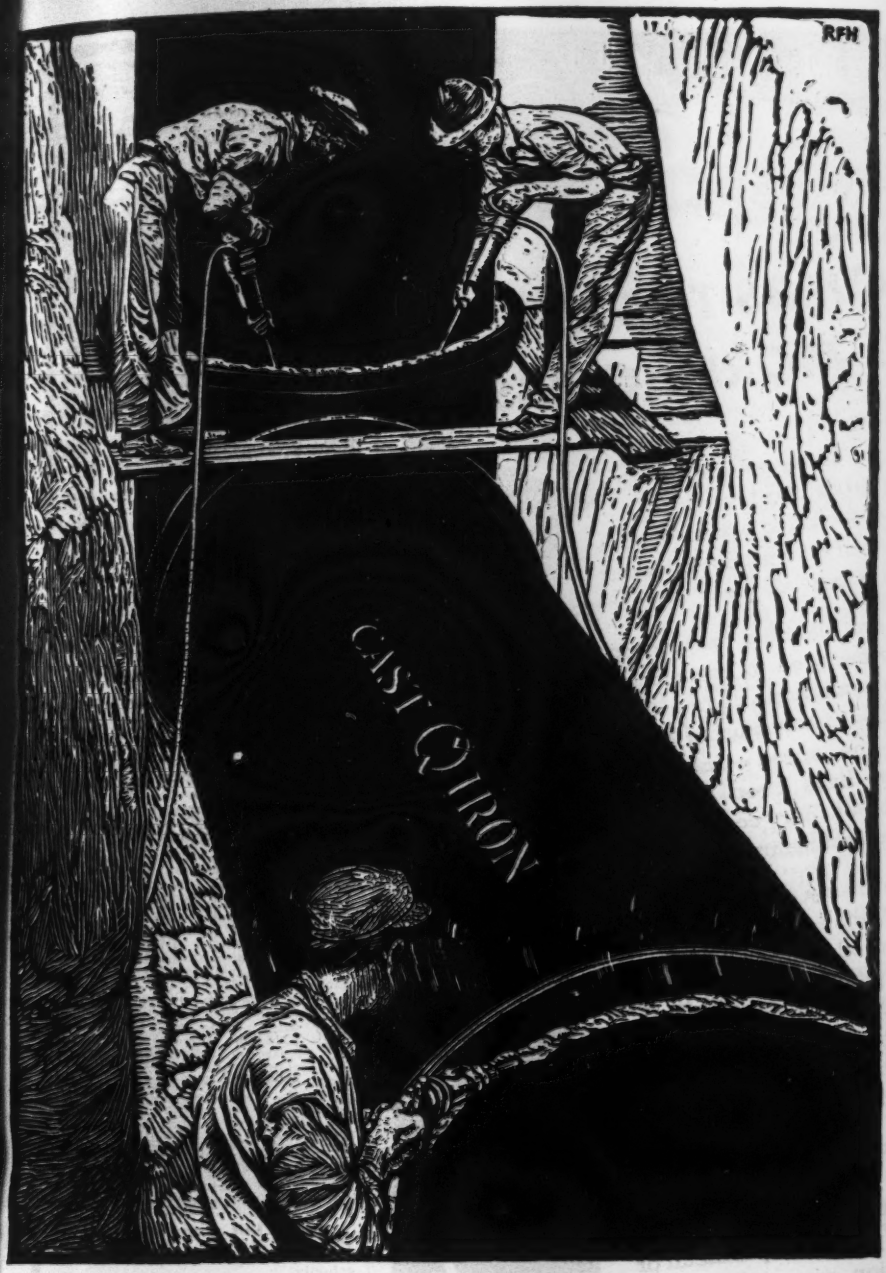
LATIN AMERICA

★**Chile, Santiago**—Republic of Chile, Santiago, constructing popular dwellings, 500,000,000 pesos. Caga de la Habitacion Popular Administration, Santiago, engrs.; offices for various ministries, 11,000,000 pesos. Dpt. P. Wks., Santiago, engr.

PUBLIC BUILDINGS

PROPOSED WORK

★**Calif., Riverside**—City, City Hall, cafeteria and auditorium bldg., for high school, $250,000; quadrangle bldgs. at Junior College, $150,000; physical education bldg., Junior High School, $125,000; Magnolia School addn. $100,000.



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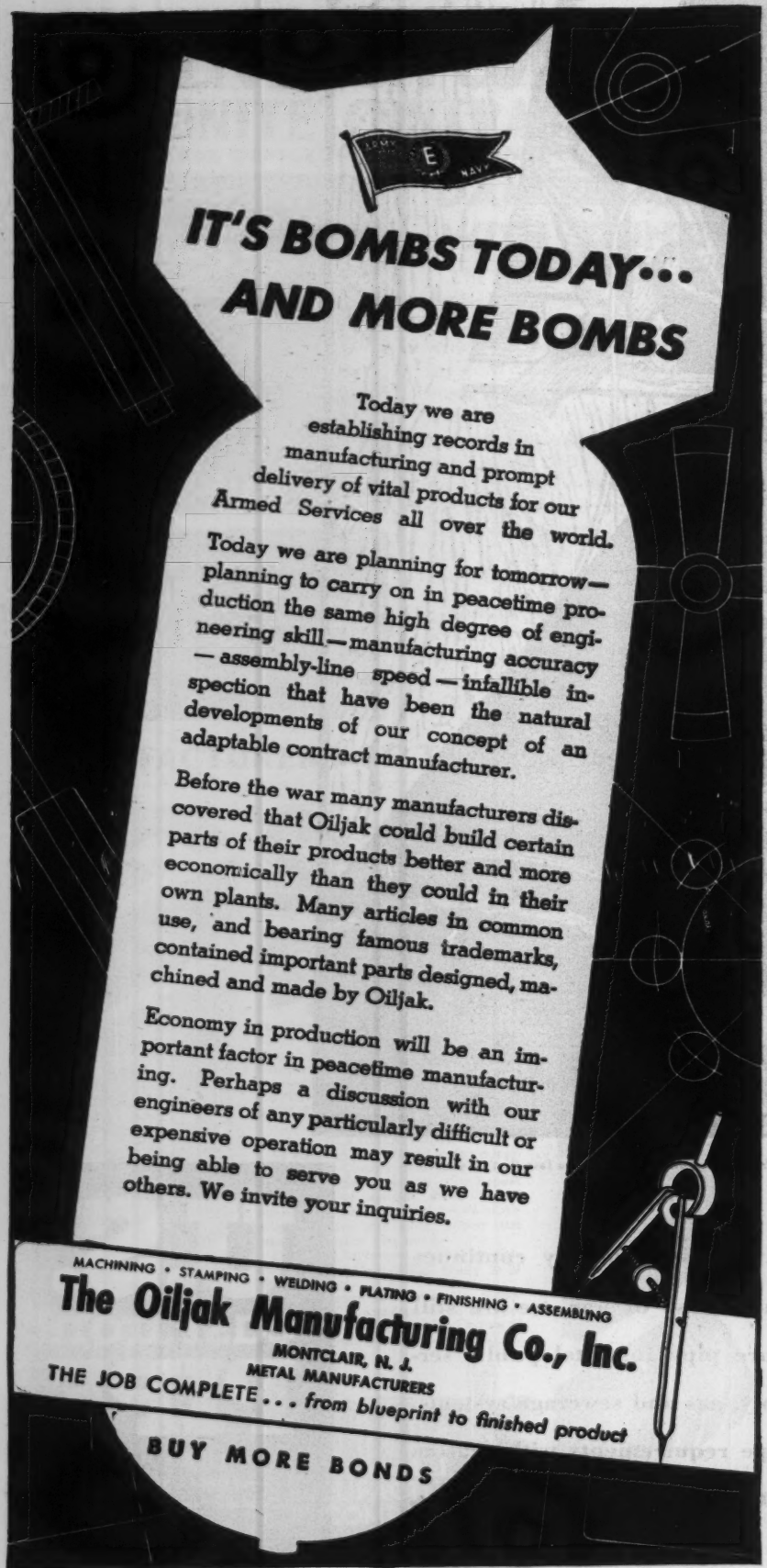
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POSTWAR PROJECTS (Cont'd.)

★ **Conn., Hartford** — Hartford Housing Auth., 846 Asylum Ave., 1,399 low price housing units, $7,345,000. Applied for federal funds.

★ **Conn., Hartford** — State Bd. Finance, State Capitol, brick, steel State Bd. Health Bldg. $985,000. Financing not provided.

Mass., Taunton—Comrs. Bristol Co., L. H. Coughlin, chn., Taunton, new unit tuberculosis sanatorium, Bristol County TB Hospital, $150,000. Financing not provided.

★ **Mich., Kalamazoo**—C. R. Rutledge, pres. Chamber of Commerce, hotel, $500,000.

Minn., Ada—Bd. Educ., C. L. Jacobson, clk., gymnasium, auditorium and classroom school addn. $150,000.

Minn., Cloquet—Bd. Educ., Cloquet, school addn. $170,000.

Minn., Elk River—Bd. Educ., Elk River, school addn. $150,000.

Minn., Fergus Falls—Bd. Educ., c/o clerk, City Hall, school addn. $300,000.

Minn., Forest Lake—Bd. Educ., F. E. Anderson, clk., school addn. $150,000.

★ **Minn., Grand Rapids**—Bd. Educ., c/o clerk, gymnasium-auditorium and classroom addns. to school instructing vocational bldg., etc. $580,000.

Minn., Hector—Bd. Educ., Dr. A. C. Wedin, clk., school addn. $150,000.

Minn., Homecroft (P. O. 247 E. Calvary Rd., Duluth)—Bd. Educ., St. Louis County Unorganized Territory, A. E. Strand, clk., Court House, Duluth, school. $193,000.

Minn., Jackson—Bd. Educ., Elizabeth McMartin, clk., school. $200,000.

Minn., Mahnomen—Bd. Educ., Mrs. Alice E. Hardy, clk., school. $230,000.

Minn., Minneota—Bd. Educ., W. K. Evans, clk., school. $250,000.

Minn., Moorhead—Bd. Educ., c/o clerk, school. $150,000.

Minn., Olivia—Bd. Educ., E. S. Bunker, clk., school addn. $150,000.

Minn., Pierz—Bd. Educ., c/o clerk, school addn. $150,000.

Minn., Red Lake—Bd. Educ., c/o clerk, City Hall, school. $250,000.

Minn., St. James—Bd. Educ., E. C. Fogarty, clk., City Hall, school addn. $350,000.

Minn., Sleepy Eye—Bd. Educ., c/o clerk, school addn. $190,000.

Minn., Warren—Bd. Educ., A. A. Harris, clk., City Hall, school. $200,000.

Minn., Wayzata—Bd. Educ., Homer Miller, clk., high school. $270,000.

★ **Mo., University City (St. Louis, Zone 5, P. O.)**—City Bd. Educ., W. L. Metcalfe, pres., 6701 Delmar Blvd., University City, St. Louis, Zone 5, plans $1,200,000 bond election Mar. 13, school bldgs. and addns. CD 1/15—ENR 1/25.

★ **Okla., Norman**—University of Oklahoma, Norman, chemistry bldg., $350,000; library addn., $300,000; graduate education bldg., $225,000; power plant, $175,000; general classroom bldg., $325,000; engineering and science hall, $425,000; new geology bldg., $400,000. Financing not provided.

★ **R. I., Providence**—State, State Capitol, brick, steel modern hospital. $500,000. Site not selected. Financing not provided.

Tex., Galveston—Bd. Trustees Galveston Public Schools, high school. $225,000. Site purchased. Financing not provided.

Tex., San Antonio—City and Bexar Co., San Antonio, transportation center, $150,000. Financing not provided.

★ **Utah, Salt Lake City**—Granite School Dist., 3212 S. State St., voted $900,000 bonds new bldgs. and expansion present schools.

★ **Wash., Seattle**—University of Washington, medical and dental school. $3,500,000.

★ **Wash., Spokane**—School Bd., Spokane, high school, $750,000.

Wash., Wenatchee—State Dpt., Finance, Olympia, National Guard Armory. $150,000.

Alta., Calgary—City, Civic Center Com., plans 2 civic auditoriums. $350,000.

★ **Alta., Edmonton**—University of Alberta, Edmonton, plans biological science bldg. $300,000, nurses' home, $350,000.

★ **Man., Pine Falls**—Province of Manitoba, c/o Ministry of Mines & Resources, Winnipeg, 100,000 hp. power development plant. $9,000,000.

★ **Man., Winnipeg**—City Hydro Comn., Winnipeg, completing Slave Falls plant, increasing capacity from 48,000 hp. to 96,000 hp. $3,000,000.

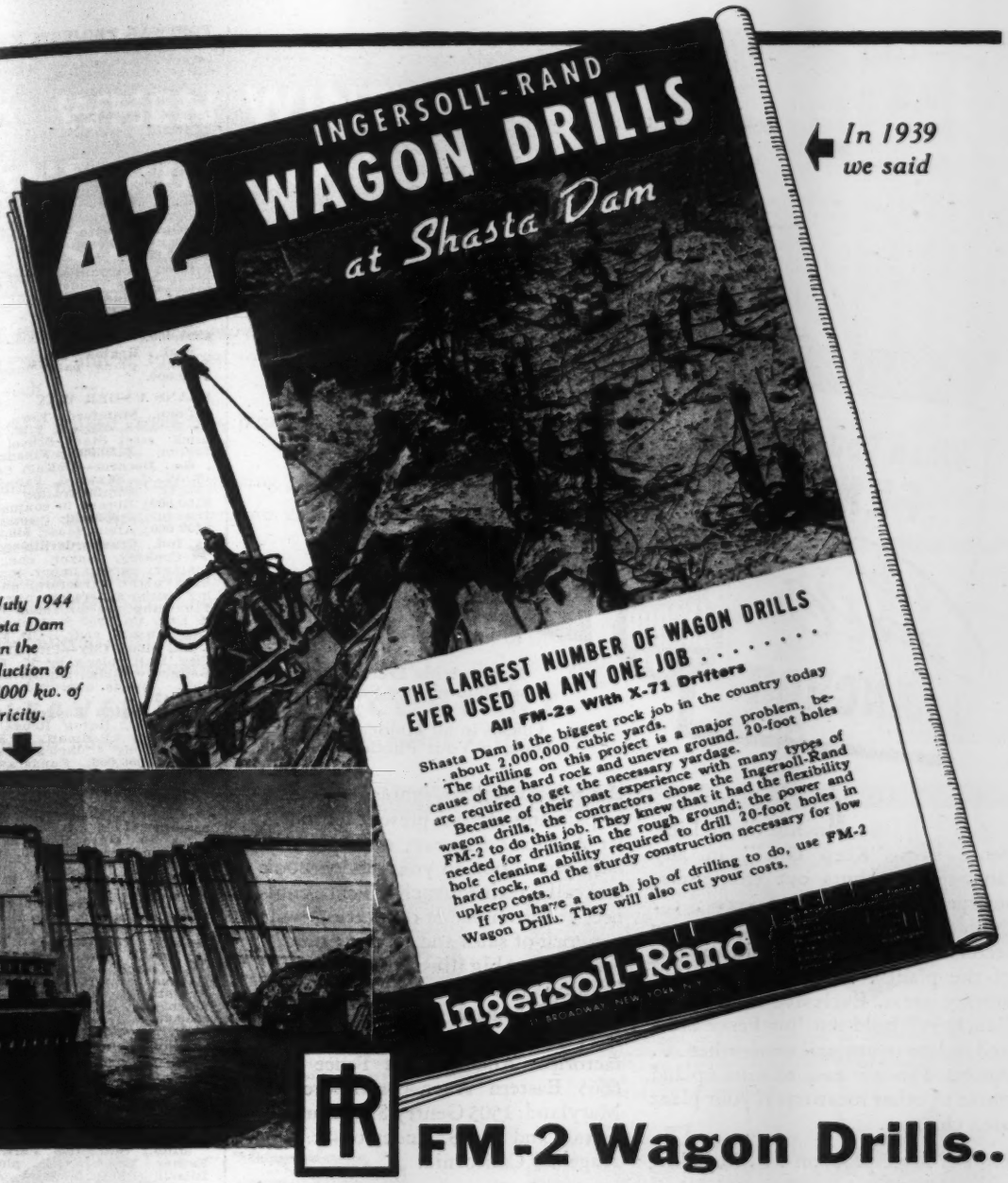
N. S., Windsor—Municipality, plans gymnasium and community hall. $150,000.

Ont., Belleville—Municipality, gas plant imprvs. $50,000.

Ont., Belleville—Municipality, plans hospital. $250,000.

Ont., Kincardine — Municipality plans hospital. $150,000.

Ont., Ottawa—University of Ottawa, Rev. P. Cornellier, Ottawa, plans 2 bldgs. $350,000.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POSTWAR PROJECTS (Cont'd)

Ont., Sault Ste Marie—City, voted to construct community bldg. and artificial ice arena. **$400,000.**

★ **Ont., Toronto**—Municipality, plans sports and community center, as Soldiers Memorial. **$1,000,000.**

★ **Ont., Toronto**—Municipality plans isolation hospital. $1,000,000.

★ **Ont., Toronto**—Municipality in association with Canadian National Exhibit Bd., remodeling exhibition bldgs. $500,000.

Ont., Toronto—Municipality, plans central police administration bldg. **$300,000.**

★ **Ont., Toronto**—Province of Ontario, plans cancer hospital and research center. **$1,000,000.**

Ont., Toronto—University of Toronto, plans men's residence. **$450,000.**

Ont., Windsor—Municipality plans hospital. **$200,000.**

Que., Magog—Municipality plans hospital. **$200,000.**

Sask., Regina—Province of Saskatchewan, Regina, plans paint manufacturing plant. **$100,000.**

PLANS UNDER WAY

Conn., Stamford—Town, Town Hall, plans by F. L. S. Mayers, 2 W. 47 St., New York, brick, steel Stark School addn., Glenbrook Section. **$150,000.** Financing not provided.

Ga., Decatur—DeKalb County, Decatur, plans by W. J. Sayward, Palmer Bldg., Atlanta, county administration bldg. and jail, **$250,000;** library in conjunction with city of Decatur, **$50,000;** court house addn., **$100,000;** Alms House, $40,000. Bonds voted.

★ **Ind., Crawfordsville**—Bd. P. Wks., T. J. Cooksey, mayor, chn., City Hall, preliminary survey imprv. municipal power and light plant, structural addn. and remodeling turbo-generator, new boilers. **$750,000.** Financing not provided. Mid-West Testing & Eng. Co., 307 S. Michigan Ave., Chicago, Ill., consult. engr. CD 8/2—ENR 8/24.

Ia., Sioux City—City, C. A. Norrbom, clk., City Hall, plans by K. E. Westerlind, 700 Badgerow Bldg., auditorium. **$414,000** available. Bonds approved. CD 9/30/43—ENR 10/7/43.

★ **La., Baton Rouge**—Louisiana State University, Baton Rouge, plans 10% completed by Bedman & Murrell, Reymond Bldg., Zone 6, men's dormitory or housing unit, **$1,000,000.** Funds available. CD 10/26—ENR 11/16.

Me., Augusta — State, H. C. Greenleaf, comr. Institutions, State House, plans by **Bunker & Savage,** 256 Water St., 3 story, bsmnt., 45x160 ft., concrete, brick addn. wing to state hospital. Over **$150,000.** Financing not provided. CD 1/17/44—ENR 1/27/44.

Me., Lewiston—City P. Wks. Dpt., City Hall, plans by A. Harriman, 88 Shepley St., Auburn, 2 story, 100x500 ft., steel frame, brick masonry P. Wks. Bldg., housing Water Street, Sewer and Light Dpts. **$200,000.** L. E. St. Pierre, 69 Park St., engr.

★ **Mass., Danvers** — Commonwealth of Massachusetts, Dpt. Mental Health, 100 Nashua St., Boston, plans completed by Appleton & Stearns, 53 State St., Boston, infirmary, Danvers State Hospital, PM-18, **$550,000.** Financing not provided. CD 4/21—ENR 5/4.

Minn., Columbia Heights (br. Minneapolis)—Bd. Educ., A. H. Ittner, clk., plans by Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, school addn. **$265,000.**

Minn., Robbinsdale—Bd. Educ., c/o R. C. Rawson, clk., City Hall, plans by Haxby & Bissell, 1111 Nicollet Ave., Minneapolis, 2 story, rein.-con. school addn. **$157,000.**

Minn., St. Louis Park—Bd. Educ., Mrs. Esther Yngve, clk., plans by Haxby & Bissell, 1111 Nicollet Ave., Minneapolis, school addn. **$220,000.**

Minn., Spring Valley—Bd. Educ., M. Larson, clk., plans by Boyum, Schubert & Sorenson, 117 W. 3 St., Winona, 2 story, bsmnt., 80x150 ft. school addn. **$150,000.**

Minn., Taylors Falls—Bd. Educ., R. C. Berg, clk., City Hall, plans by W. M. Ingemann, 210 Anchor Bldg., St. Paul, 3 story, 113x216 ft. school. **$170,000.**

Minn., Winona—Bd. Educ., Adele H. Kressin, clk., plans by Boyum, Schubert & Sorenson, 117 W. 3 St., two 2 story, bsmnt., rein.-con., cut-stone brick school bldgs., etc. **$300,000.**

★ **Mo., Kirkwood (St. Louis, Zone 22, P. O.)**—Kirkwood School Dist., F. P. Tillman, pres. Bd. Educ., 702 South Kirkwood Rd., Kirkwood, St. Louis, Zone 22, plans by Bensack & Pearce, Inc., 408 Olive St., St. Louis, Zone 1, expan., imprv. school sys., incl. school in North Kirkwood on Quail Ave., and addn. to J. Milton Turner School, Saratoga and Milwaukee Aves.; repairing other bldgs. **$650,000** bond election Feb. 12, for same.

★ **Mo., Normandy (St. Louis, Zone 21, P. O.)**—Normandy Consolidated School Dist., F. B. Miller, supt. Bd. Educ., 6701 Easton Ave., Normandy, St. Louis, Zone 21, plans by Wm. B. Ittner, Inc., engrs.-archts., 408 Bd. Education Bldg., 911 Locust St., St. Louis, Zone 1, brick, concrete, stone high school accommodating 1,500 pupils, Lucas Hunt and St. Charles Rock Rds. **$1,150,000** bond election Feb. 6, for same.

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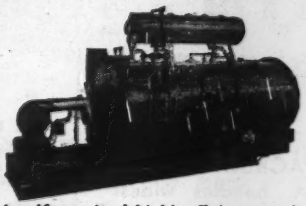

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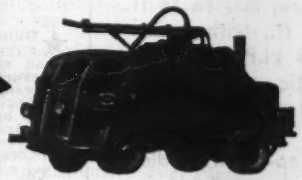

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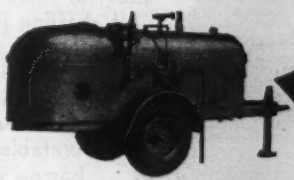

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POSTWAR PROJECTS (Cont'd.)

Mont., Big Sandy—Bd. Educ., Chouteau County, Fort Benton, plans by F. Brinkman, Kalispell, high school. $180,000 bond issue approved.

Neb., Lincoln—City, City Hall, combined water and light dept. service bldg., garage and warehouse. $100,000. D. L. Erickson, City Hall, city engr.

New York — Dpt. Parks, Arsenal Bldg., Central Park, 5 Ave. and 64 St., New York, plans completed by Skidmore, Owings & Merrill, 5 E. 57 St., New York new south wing, Staten Island Institute of Arts & Sciences, Richmond Co., S7-1. $36,000. Financing not provided. CD 3/26/43—ENR 4/1/43.

★**N. Y., Flushing**—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, Zone 1, plans by A. Wilson, Rockland Ave., Mamaroneck, P. S. 26, vicinity of 188 St. and 73 Ave., Proj. E-300, $848,000.

★**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., Zone 7, plans completed hospital for chronic diseases on Welfare Island, for Dpt. Hospitals, 125 Worth St., Zone 13. $6,000,000. Financing not provided. A. Gordon Larimer, chf. Bureau Architecture. CD 10/19—ENR 11/2.

★**N. Y., New York**—New York City Housing Auth., 122 E. 42 St. Zone 17, plans 70% completed by O'Connor & Delany, 162 E. 37 St., Zone 16, A. Embury, II, 150 E. 61 St., Zone 21, and M. W. Del Gaudio, 2872 Bainbridge Ave., Zone 58, Morrisania Houses, on site bounded by Morris Ave. and 146 St., College Ave. and E. 146 St., and 3 Ave. and E. 140 St. $7,058,000. CD 7/15/43—ENR 7/22/43.

★**N. Y., New York**—New York City Housing Auth., 122 E. 42 St. Zone 17, plans 70% completed by E. M. Forbes, 22 Bethune St., Zone 14, L. Skidmore, 5 E. 57 St., Zone 22, and V. W. Tandy, 1974 Bway., Zone 23, Abraham Lincoln Houses on site bounded by 5 and Park Aves., E. 132 and E. 135 Sts. $5,569,000. CD 7/15/43—ENR 7/22/43.

★**N. Y., New York**—New York City Housing Auth., 122 E. 42 St., Zone 17, plans 70% completed by R. J. Riley, 62 W. 45 St., Zone 19, H. M. Prince, 101 Park Ave., Zone 17, and J. Whittlesey, 31 Union Square, Zone 3, James Weldon Johnson Houses, on site bounded by 3 and Park Aves., E. 112 and E. 115 Sts. $5,407,000. CD 7/15/43—ENR 7/29/43.

★**O., Cleveland**—City, A. L. Munson, dir. P. Properties, City Hall, plans 10% completed by H. Kregelius, City Hall, truck terminal accommodating 500 trucks. $2,000,000. Land rights not cleared, financing not provided.

★**O., Columbus**—City, City Hall, plans 5% completed light plant expan., sub stations, distr. sys., $1,600,000. Legal obstacles to be overcome, financing not provided. P. W. Maetzel, City Hall, city engr. CD 1/29/43—ENR 2/4/43.

O., Ironton—City, City Hall, municipal bldg. $250,000. K. R. Wentz, city engr.

O., Lebanon—Warren Co. Bd. Comm., Lebanon, plans by Grunkemeyer & Sullivan, 3717 Eastern Ave., Cincinnati, 2 story, brick juvenile detention home. $200,000. Financing not provided.

O., Newark—City, Dpt. Pub. Serv., Div. Engineering, city hall and site, $250,000; public library, $100,000. C. H. Wells, City Hall, city engr.

Okla., Tulsa— City, City Hall, plans 50% completed constructing, equip. 5 fire stations, exten. fire alarm sys. $318,000. Funds available. J. Koberling, Court Arcade Bldg., consult. engr. D. W. Patton, Municipal Bldg., city engr. W. R. Wooten, asst. city engr.

★**Okla., Tulsa**—City and County of Tulsa, city-county bldg. or bldgs. $2,500,000. Land rights not cleared, legal obstacles to be overcome, financing not provided. W. R. Wooten, Tulsa, asst. city engr.

Ore., Hillsboro—School Bd. Hillsboro, plans by Annand & Kennedy, Central Bldg., Portland, remodeling Junior High and Peter Boscow Schools and high school addn. $325,000.

Pa., Narberth—Narberth Boro, 107 Forrest Ave., G. B. Suplee, supt. P. Wks., plans by Keibler & Wollington, Phila., boro hall, $154,000. Land rights not cleared, financing not provided. John M. Irvine Associates, 315 S. 15 St., Phila., consult. engr.

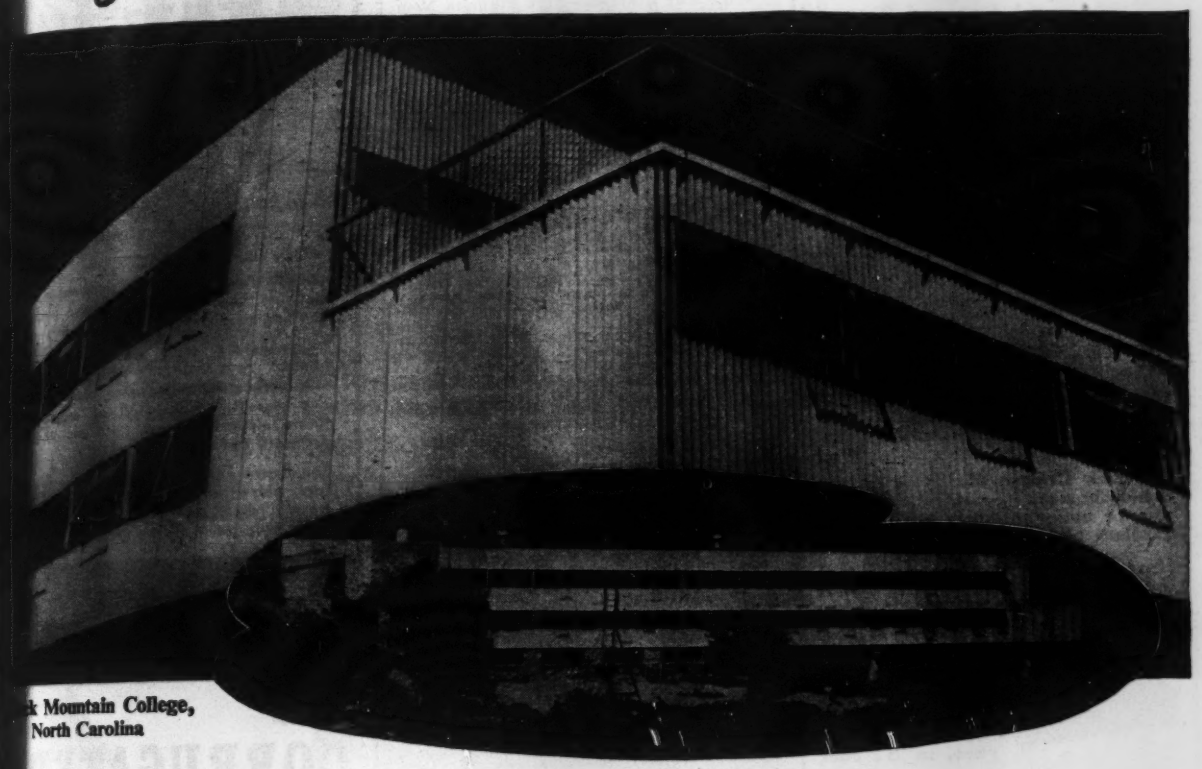
★**Pa., Reading**—Berks Co., Court House, 2 hospitals, 2 other bldgs. $1,139,000. Financing not provided. W. C. Fry, Jr., Court House, co. engr.

Tex., Goose Creek—Goose Creek Ind. School Dist., Goose Creek, plans by Hedrick & Lindsley, 811 So. Standard Bldg., Houston, Junior High School, $150,000; school, $150,000. Financing not provided.

Tex., Houston—Houston Independent School Dist., 1600 Washington St., plans 25% completed by Lamar Q. Cato, 2111 W. Gray Ave., 1 story, 140 x 280 ft., steel, masonry type, stone college. $250,000. Partly financed. CD 10/11—ENR 10/19 under Public.

★**Wash., Seattle**—School Dist. 401, 253 E. 152 St., plans by W. Mallis, Lyon Bldg., 3 and James Sts., Zone 4, 4 addnl. brick veneer and masonry wings to high school incl.

CORRUGATED TRANSITE
for Modern Streamlined Buildings?



k Mountain College,
North Carolina

Yes, more and more, architects find J-M Corrugated Transite ideal for expressing the new design trend for simplified construction.

BECAUSE of its amazing durability and fireproof characteristics, *Corrugated Transite* has been used extensively, and with outstanding success, in industrial construction for many years. Now architects are discovering that it is equally adaptable to EVERY type of modern building. Unusually attractive in appearance it lends itself to flexibility of design.

An excellent example of this new trend is the modern, streamlined college building shown above. Here, the entire exterior walls are *Corrugated Transite*. In other cases used vertically and even horizontally, it provides pleasing contrasts in combination with other exterior building materials, such as stone, brick, etc.

Here are a few of the outstanding advantages of *J-M Corrugated Transite* that have made it popular in wartime use and that qualify it for your consideration, no matter what type of construction you plan . . .

1. It's durable, because it's made of asbestos and cement, two almost indestructible materials, compressed and corrugated under terrific pressure for extra strength.

2. It's practical, because it can't burn, can't rust, can't rot, and has high resistance to acids, to gaseous fumes, and to severe temperatures.

3. It's economical, because it requires little or no maintenance, is 100% salvageable . . . easily and quickly installed.

4. It's versatile, because its stone-gray color and beautiful, symmetrical lines blend well with modern architectural plans and designs.

If you desire more specific and detailed information as to how *J-M Corrugated Transite* can solve your construction problems, send for our illustrated brochure on this subject. Call or write Johns-Manville, 22 East 40th Street, New York 16, New York.

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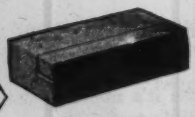
Your Special Size and Shape Brick or Tile can now be "Tailor-Made" at a moment's notice!

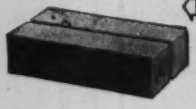
The new Clipper Multiple Cutting Principle makes possible faster cutting of every masonry material regardless of hardness.

Here are a few typical examples of the speed and accuracy with which fire brick can be cut for furnace repairs.

This acid brick intended for a chemical plant acid chamber was cut completely in two, in 37 sec.

One of many intricate cuts performed on first quality clay brick for heat treating furnaces. Made in 8 seconds.





Silica brick cut lengthwise for open hearth furnace work, only 9 seconds were required to complete this cut!

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnesite brick was cut in 12 seconds!

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POSTWAR PROJECTS (Cont'd.)

50x79 ft. wing housing gymnasium, 3 story, 60x88 ft., wing, two 2 story, 50x75 ft. wings, separate 1 story, 156x164 ft. bldg. **$600,000.** Financing provided.

★**W. Va., Keyser**—Potomac State School, West Virginia University, Keyser, plans completed by L. D. Schmidt, Fairmont, Reynolds Hall for Women, Davis Hall for Men, central heating plant, altering administration bldg. **$1,200,000.** Financing not provided.

Wis., Fort Atkinson—Fort Atkinson Memorial Hospital Assn., Fort Atkinson, plans by E. A. Stubenrauch, 708 Erie Ave., Sheboygan, hospital. **$250,000.** Financing not provided.

★**Wis., Milwaukee**—Bd. Educ., 1111 N. 10 St., Zone 3, plans by G. E. Wiley, c/o owner, for 5 year program, incl. West Division High School **$2,225,000**; North Side Tech. Nich School, **$2,225,000**; imprv. Boys Tech. High School, **$300,000**; Bartlett Ave. High School, **$400,000**; Kosciuszko School, **$40,000**; Berger School, **$30,000**; Washington High School addn., **$75,000.** Financing not provided.

Wis., Milwaukee—City, W. M. Swiltlik, comr. P. Wks., City Hall, Zone 2, plans by C. Malig, City Hall, garage. **$375,000.** Financing not provided. J. P. Schwada, City Hall, city engr.

Wis., Wausau—Bd. Educ., E. C. Hirsch, supt., City Hall, plans by Openhamer & Obel, Wausau, school replacing Lincoln School. **$250,000.**

Ont., London—Bd. Educ., F. G. McAlister, 195 Dundas St., plans by L. E. Carrothers, c/o owner, brick, steel school. **$150,000.**

★**Ont., London**—Dpt. P. Wks., Ottawa, Ont., plans by C. D. Sutherland, c/o owner, addn. Westminster Hospital. **$500,000.** W. M. Veitch, City Hall, engr.

★**Ont., London**—Dpt. P. Wks., Ottawa, Ont., plans by C. D. Sutherland, archt., Dominion Government Office. **$750,000.**

Ont., London—Dpt. P. Wks., Ottawa, plans by C. D. Sutherland, c/o owner, Institute of Public Health. **$250,000.**

Ont., Ottawa—Dominion Government, Ottawa. plans by Dpt. P. Wks., Ottawa, Library of Parliament addn. **$300,000.**

Ont., Strathroy—Strathroy Public School Bd., plans by S. B. Coon & Son, St. Thomas St., Toronto, school. **$150,000.** CD 2/11—ENR 3/2.

★**Sask., Saskatoon**—University of Saskatchewan, Regina, plans by F. H. Portnall, Canadian Bank of Commerce Bldg., Regina, and E. T. Gilbert, C.P.R. Bldg., Saskatoon, medical school. **$500,000.** CD 2/10—ENR 2/24.

READY FOR BIDS

Fla., Jacksonville—City, City Hall, plans completed expan., imprv. North Shore Branch Library, **$58,720**; enlarging, imprvs. Lake Shore Branch Library, **$58,720**; enlarging South Jacksonville Public Library Branch, **$39,300**; Main St. branch library addn., **$32,700**; addns. to Park St. branch library repairing Springfield, Park St., and Negro Libraries, addn., **$29,100.** Financing provided. W. E. Shedden, Engineers Bldg., engr.

★**Minn., Minneapolis**—Bd. Educ., Alma Hecker, clk., 305 City Hall, plans completed gymnasium, auditorium and classroom addn. to vocational high school, 3 Ave. S. and 11 St., **$650,000**; classroom addn. to Southwest High School, 47 St. and Beard Ave. S., **$500,000.** Div. Bldgs., c/o owner, archt.

★**Neb., Lincoln**—City, City Hall, plans completed by Associated Architects, c/o owner, municipal auditorium, **$850,000.** Financing provided. D. L. Erickson, City Hall, city engr. CD 8/5/43—ENR 8/12/43.

★**N. Y., New York**—New York City Housing Auth., 122 E. 42 St., Zone 17, plans completed by W. Lescaze, 211 E. 48 St., Zone 17, and A. M. Brown, 150 E. 61 St., Zone 21, Elliott Houses on site bounded by W. 25 and W. 27 Sts., 9 and 10 Aves. **$2,271,000.**

★**N. Y., New York**—New York City Housing Auth., 122 E. 42 St., Zone 17, plans completed by H. Wiley Corbett, 300 Fourth Ave., Zone 10, A. C. Holden, 570 Lexington Ave., Zone 22, and G. Atterbury, 139 E. 53 St., Zone 22, Amsterdam Houses, on site bounded by W. 61 and W. 64 Sts., West End and Amsterdam Ave. **$3,880,600.**

Tex., Port Lavaca—City, F. H. Dudgeon, mayor, City Hall, plans completed 3 story, 48x70 ft., rein.-con., structural clay tile, freeze plant, cork insulation, refrigeration, etc. **$125,000.** Financing available. Garrett Engineering Co., 1806 Milam St., Houston, consult. engr. CD 9/29—ENR 10/19.

Wash., Clarkston—School Dist. 250, Clarkston, plans completed by Whitehouse & Price, Hutton Bldg., Spokane, for school and plans under way 2 story high school, gymnasium and auditorium; **$450,000** bonds voted. CD 9/14—ENR 10/5.

PROJECTS CANCELLED

Ind., Anderson—City, 1301 Lincoln St., project cancelled, junior high and elementary school, 29 St. **$400,000.** Now going ahead. E. F. Miller, Anderson Bank Bldg., archt. CD 8/31—ENR 9/21.

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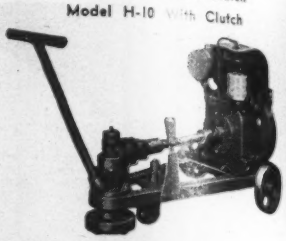

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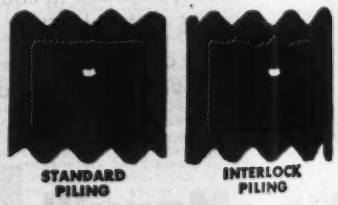

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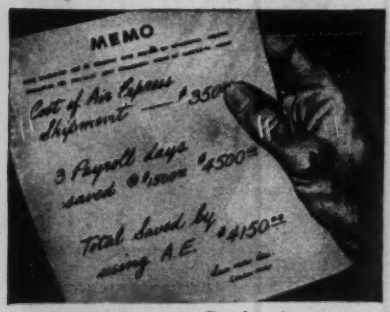

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POSTWAR PROJECTS (Cont'd.)

Mich., Detroit—Bd. Educ., 1354 Bwayboltham Addn. 1, $139,930; Law Addn. 1, $185,539; Mason Addn. 1, $199,004; 1st unit, $178,356. Work now going ahead. G. R. Thompson, City Hall, city engr. CD 8/25—ENR 9/7.

COMMERCIAL BUILDINGS

PROPOSED WORK

★**Ariz., Phoenix**—Young Men's Christian Assn., 130 West Monroe St., 6 story YMCA bldg. $500,000.

★**Conn., Bridgeport**—Bridgeport Boys Club, F. Flicker, chn. Bldg. Comm., 331 Middle St., boys' club, brick, steel, $700,000. Financing not provided.

PLANS UNDER WAY

Conn., Stamford—A. Spelke, 54 Park Row, frame housing, Newfield and Weed Aves. $150,000. Financing not provided.

Ind., Lafayette—Catholic Diocese, Lafayette, chapel at Purdue University, $150,000.

La., Baton Rouge—Young Men's Christian Assn., 311 N. 4 St., Baton Rouge, 2 story, bsmnt., YMCA bldg., on Louisiana State University campus, $150,000. Financing not provided.

Mass., Boston—Staley College of Spoken Word, 162 Babcock St., Brookline, brick auditorium, $160,000. Financing not provided.

Mass., New Bedford — Young Men's Christian Assn., William St., remodeling YMCA bldg., William St., $150,000. Financing not provided.

★**Mass., Worcester**—Garden Housing Co., A. P. Loshen, 163-18 Jamaica Ave., Jamaica, N. Y., 108 unit frame housing development, Park Ave. and Salisbury Pond. $650,000. Financing not provided.

★**N. C., Raleigh**—Shaw University, Dr. Robt. P. Daniel, pres., Raleigh, administration bldg., 2 dormitories, etc., Blount and South Sts. $950,000. Financing not available.

N. C., Raleigh—N. C. Theatres, Inc., c/o W. G. Enloe, mgr., 115 Fayetteville St., theatre, Fayetteville St. Over $150,000. Site purchased.

S. C., Chester—Efird's Dpt. Store, Chester, department store, Gadsden and Church Sts. Over $150,000. Financing provided but plans incomplete.

Tex., Dallas—First Unitarian Church, 2419 Maple St., church. $150,000. Financing not provided. Site purchased.

Tex., Galveston—Gulf Properties, Inc., S. Maceo, 1601-24 St., commercial bldg., facilities, Over $150,000. Site purchased.

Tex., Galveston — Young Men's Christian Assn., c/o C. Johnson, 707-23 St., YMCA general bldg. $175,000. Financing in progress.

Wis., Beaver Dam—Wayland Academy, Dr. C. M. Wilcox, chn., Beaver Dam, gymnasium and other bldgs. $150,000. Financing not provided.

Wis., Milwaukee—St. Catherine's Parish, N. 51 St. and W. Center Sts., church. $350,000. Financing not provided.

N. S., Antigonish—St. Francis Xavier University, P. J. Nicholson, pres., Antigonish, laboratory and library bldg. $210,000.

N. S., Glace Bay—Famous Players Canadian Corp., Royal Bank Bldg., Toronto, Ont., plans theatre. $150,000.

N. S., New Waterford—Famous Players Canadian Corp., Royal Bank Bldg., Toronto, Ont., plans theatre. $150,000.

Ont., Chesley—Chesley and District Memorial Hospital Bd., Rev. A. R. Gibson, Chesley, plans hospital. $150,000.

★**Ont., London**—Kresge Store Co., Ltd., 150 Dundas St., plans store, Dundas St. $500,000.

★**Ont., London**—London Life Insurance Co. Ltd., Dufferin St., office. $1,000,000.

Ont., London—Odeon Theatre Co., Ltd., 1473 Queens St. W., plans theatre. $150,000.

Ont., Toronto—H. Gaffney, 1552 Bathurst St., plans dwellings. $170,000.

Que., Mount Royal—Montreal Roman Catholic Episcopal Corp., Lagauchitiere St. W., Montreal, plans church. $150,000.

Que., Verdun—Roman Catholic Episcopal Corp., W. Lagauchitiere St., Montreal, church. $150,000.

Sask., Swift Current—The Tripp Lumber Co., Ltd., office, Railway St. and 1st Ave, W. $175,000-$200,000.

PLANS UNDER WAY

★**Ariz., Phoenix**—Hotel Westward Ho, 618 North Central Ave., plans by Byron & Laraway, c/o owner, 10 story, 100x140 ft. hotel addn. $750,000.

Conn., Bridgeport — St. Ann's Roman Catholic Parish, H. J. Coleman, pastor, 481 Bewster St., plans by J. Gerald Phelan, 211 State St., brick colonial church, old New England steeple, $150,000. Financing not provided.

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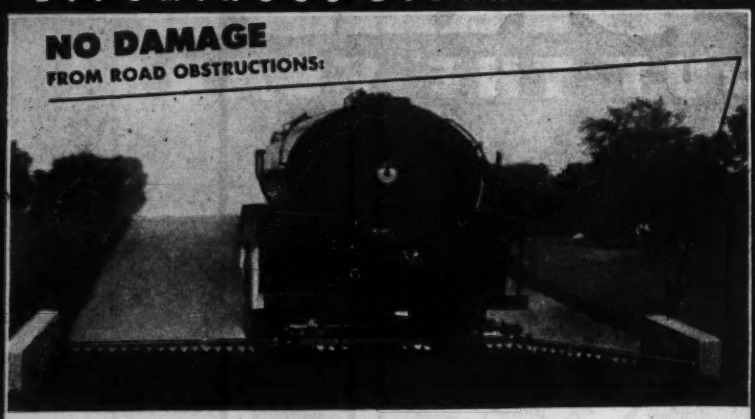

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POSTWAR PROJECTS (Cont'd.)

Conn., New Britain—St. Andrews Parish, M. A. Pankus, pastor, 336 Church St., plans by D. K. Perry, 17 Court St., 2 story, bsmnt., 45x115 ft., brick, steel, reinforcement, community bldg., incl. 600 seating capacity auditorium, connecting bldg. addn., alterations, $150,000. Financing not provided.

D. C., Wash. — Washington Cathedral, Mount St. Albans, Wash., plans by P. Frohman, Washington Cathedral Office Bldg., Wash., D. C., Washington Cathedral Library, deanery, $70,000. Funds available. $400,000;

★**Ind., Howe** — Howe Military Institute, preliminary plans by A. M. Strauss, 415 Cal-Wayne Bldg., Fort Wayne, remodeling 3 present bldgs., and new residences for faculty members, $600,000.

La., Alexandria — Alexandria Diocese, Bishop D. J. Desmond, plans by C. D. Roberts, Guaranty Bank Bldg., 150-bed catholic hospital, $300,000. Financing available. CD 11/1—ENR 11/16.

Md., Baltimore—Christ Lutheran Church, Hill and Charles Sts., plans by P. Frohman, Washington Cathedral Office Bldg., Wash., D. C., Christ Lutheran church. Not to exceed $200,000. Funds available.

Neb., Omaha—Childrens Hospital Assn., H. Hall, pres., 45 St. and Dewey Ave., plans by J. Latenser & Sons, 1307 Farnam St., hospital. $200,000. Funds available.

N. Y., Albion—Arnold Gregory Memorial Hospital, E. Archbald, pres., plans 95% completed by H. Martin, 315 Alexander St., Rochester, 3 story, bsmnt., brick, steel, concrete hospital, $150,000.

Ore., Portland—Multnomah Hotel, D. Ireland, mgr., 319 S.W. Pine St., plans by Pietro Belluschi, 2040 S.W. Jackson St., reconstructing grand ballroom, lobby, banquet and meeting rooms. $250,000. Financing provided, plans incomplete.

Pa., Phila.—The Supplee Wills Jones Milk Co., H. Supplee, Jr., pres., 1523 N. 26 St., plans 80% completed, office bldg. $350,000. Financing provided.

Tex., Corpus Christi—Young Men's Christian Assn., Corpus Christi, plans 1% completed by Brock, Roberts & Anderson, Jones Bldg., expan., remodeling YMCA general bldg. $150,000. Financing available.

Tex., Dallas—Highland Park Presbyterian Congregation c/o J. C. Pew, chn., 3300 McFarlane St., Dallas, plans by M. Lemmon, Tower Petroleum Bldg., sunday school addn., remodel church. $200,000.

Tex., San Antonio—Alamo Lumber Co., 2110 S. Flores St., plans 50% completed 1 and 2 story dwellings. $425,000. Financing available.

Tex., San Antonio—St. Gerard Church, 1617 Iowa St., plans 50% completed by Phelps & DeWeese & Simmons, 1515 Majestic Bldg., Junior-Senior High School. $150,000. Financing available. CD 1/22.

★**Tex., Sequin**—Texas Lutheran College, Sequin, plans completed by A. B. & R. M. Ayres, Transit Tower Bldg., San Antonio, chapel, $150,000; power plant for lighting and heating college campus bldg., $40,000; rein.-con. grandstand, athletic grounds development, etc., $30,000; union bldg., $150,000; boy's dormitory, $150,000; gymnasium, $40,000; library, $150,000. Partially financed. CD 10/6—ENR 10/19.

Vt., Springfield — Springfield Hospital, Ridgewood, plans by O. Thayer, 45 Franklin St., Boston, Mass., brick, steel hospital addn., incl. children's ward. $250,000. Financing not provided.

READY FOR BIDS

★**Tex., Houston**—Baylor University Medical College, 509 Lincoln St., plans completed by Hedrick & Lindsley, 811 Southern Standard Bldg., 4 story, bsmnt., steel, masonry, stone type medical school, $1,000,000. Financing provided. CD 5/9—ENR 5/16.

Ready for Bids

Of $17,000,000,000 of proposed postwar construction at beginning of 1945 only $500,000,000 was reported "ready for bids", plans complete and financing available.

If you have projects "ready for bids", please send them in to be added to the total above to give a measure of the materials that will be needed to relax restrictions and go ahead with civilian work.

Send ready-for-bids projects news to Elsie Eaves, Manager, Business News Department, Engineering News-Record, 330 W. 42 St., New York 18, N. Y.

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N. C., Charlotte — A. Lloyd Goode and Roy L. Goode, Builders Bldg., theater, Providence Rd. between Cherokee Rd. and Fenton Place, to A. Lloyd Goode Contracting Co., Builders Bldg. Est. $225,000-$250,000.

★**Pa., Springfield**—Springfield Gardens Co., c/o H. Takiff, Real Estate Trust Bldg., Broad and Chestnut Sts., 91 residences. Owner builds. $675,000-$750,000. Financing provided. J. G. Ludwig, Farmers & Mechanics Bldg., West Chester, archt.

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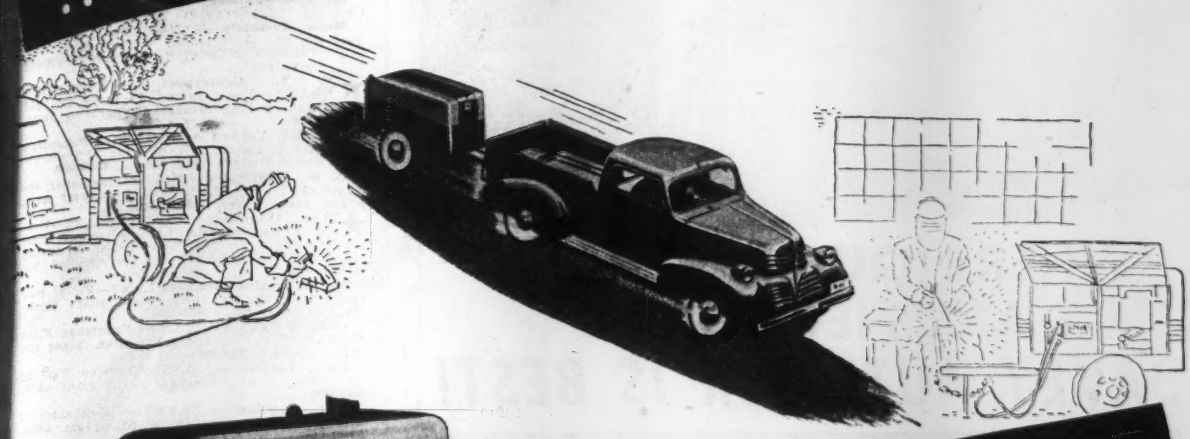
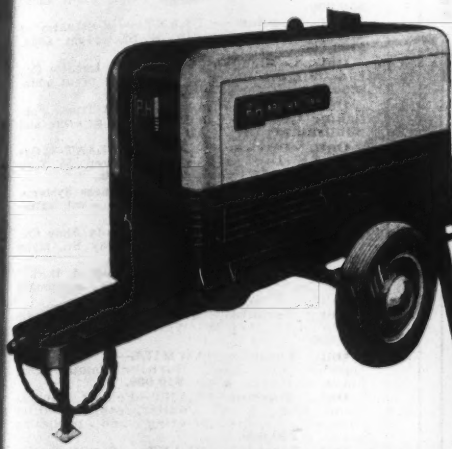


. . . IN THE SHOP



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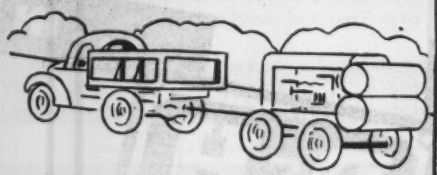
WHERE QUICK REPAIRS ARE NECESSARY DAVEY AUTO-AIR IS BEST!

SAVES · TIME · MONEY · MANPOWER

The conventional, trailer-mounted air compressor still has its place on construction jobs where air is needed in one place for a period of days or weeks. Here, the famous Davey *Air Aristocrat* does a job second to none.



MOST COMPRESSOR JOBS ARE SMALL

But most construction compressed air jobs are small — and can be done FASTER, MORE ECONOMICALLY, WITH LESS MANPOWER by taking advantage of the *MOBILITY* of the DAVEY AUTO-AIR COMPRESOR.

The Davey AUTO-AIR is mounted on the truck, and will go anywhere as fast as the truck can go. At the same time, because the AUTO-AIR occupies less than one-third of the body space, the same truck can carry the men, tools and materials to do the job.

Power for the compressor is taken direct from the truck engine through the Davey Power-Take-Off. Use of one engine reduces "first" cost, lowers operating and maintenance costs — provides more air-per-dollar-invested over a long period of years. This time-proved, heavy-duty compressor can be mounted on most trucks — whether new or already in use and can be readily changed from one truck to another.

Available in 60, 105, 160, 210 and 315 cfm capacities.

EVERY CONTRACTOR CAN USE AT LEAST ONE DAVEY AUTO-AIR COMPRESSOR TO GET *MORE JOBS DONE PER DAY . . . FASTER, CHEAPER*

DAVEY PNEUMATIC SAWS

"Another Davey time-saver, man-saver, and money-saver." Portable, efficient, cross-cut saw for felling and bucking timber, piling and shoring. Operates anywhere—even under water. Three sizes — 15", 18", 24" blades. Can cut 15" timber in 40 seconds.

COMPLETE YOUR ENGINEERING LIBRARY

For full information on the complete Davey line of Compressors, Truck Power Take-Offs, Pneumatic Saws and additional pneumatic engineering data, write today for free catalog E-172.

D-145-1

DAVEY *Compressor Co.*

KENT · OHIO

DEALERS IN PRINCIPAL CITIES

POSTWAR PROJECTS (Cont'd.)

INDUSTRIAL BUILDINGS

PROPOSED WORK

Ind., Anderson—POWER PLANT—Arvada File Works (Div. Nicolson File Co.), power plant, $80,000 or more with equip.

Ind., Fort Wayne—WAREHOUSE, etc.—Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Pa., modern warehouse and office bldg., Douglas Ave. and Barr St., on site 160 ft. square.

Ia., Des Moines—PLANT—Miller Products Co., 713-723 Cherry St., plant.

Mass., Peabody—TANNERY—J. Rimer, 71 Tedesco St., Marblehead, 1 story brick, concrete tannery, Howley St., $50,000. Financing not provided.

★**N. Y., Centerport** — GENERATING PLANT—Long Island Lighting Co., 250 Old Country Rd., Mineola, generating plant, $2,500,000.

★**O., Mt. Vernon** — PLANT — Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Pa., window glass plant addn., $700,000.

B. C., Vancouver—PLANT—Insulation Industries B. C., Ltd., 475 Industrial Ave., plans plant exten. $50,000.

★**Man., Winnipeg**—POWER PLANT—Winnipeg Electric Co. Ltd., Winnipeg, completing Seven Sisters Power Plant, increasing capacity from 60,000 hp. to 225,000 hp., $9,000,000.

N. B., Saint John—PLANT—Foley Pottery, Ltd., Saint John, plans plant reconstruction, addns. $50,000.

Ont., Kingston—PLANT—Frontenac Floor & Wall Tile Co., Ltd., Kingston, plans tile mfg. plant. $40,000.

Ont., London—PLANT—Coleman Packing Co., Ltd., 1 St., London, plans plant addn. $50,000.

Ont., London — PLANT — Kelvinator of Canada, Ltd., Dundin E St., plant addn. $100,000.

Ont., London—PLANT—John Labatte Co., Ltd., Simcoe St., plans brewery plant addn. $200,000.

Ont., Orillia—PLANT—Packet-Times Publishing Co., Ltd., Orillia, plans printing and publishing plant. $40,000.

Ont., Toronto—TEXTILE PLANT—Atlas Woollens, Ltd., c/o B. M. Singer, 55 York St., plans textile plant. $40,000.

Ont., Toronto—PLANT—Business Systems, Ltd., 52 Spadina Ave., plans plant exten. $40,000.

Ont., Toronto—PLANT—Canada Shoe Co., Ltd., c/o J. O. Plaxton, 330 Bay St., plans plant. $50,000.

Ont., Toronto—PLANT—Gilbert & Barker Mfg. Co., Ltd., 64 Jefferson Ave., equipment manufacturing plant.

Ont., Toronto—FACTORY—G. A. Hardie & Co., Ltd., 468 W. Wellington St., factory. $40,000.

Ont., Toronto—SAWMILL—J. B. Morgan Lumber Co., Ltd., Harbour Comn. Bldg., plans sawmill, etc. $40,000.

Ont., Toronto—PLANT—Poulter Publications, Ltd., R. C. Poulter, engr., 25 Otter Crescent, plans printing and publishing plant. $40,000.

Ont., Toronto — PLANT — Service Station Equip. Co., Ltd., 101 Hanson St., plans by C. M. Konvalinka, 101 Hanson St., plant expan.

Ont., Toronto—PLANT—Willards Chocolates, Ltd., 453 W. Wellington St., plans plant addns.

Que., Limoilou (Postal District Quebec City)—GARAGE, etc.—Rolland Guilmette, First Ave., plans garage and automobile repair shop. $50,000.

PLANS UNDER WAY

N. J., Camden—PLANT—The Supplee Wills Jones Milk Co., H. Supplee, Jr., pres., 1522 N. 26 St., Phila., Pa., plans 80% completed enlarging plant, $400,000. Financing provided. CD 12/13—ENR 12/28.

N. J., Cranford—PLANT—Johnson & Johnson Co., Highway 1, New Brunswick, plans by The Ballinger Co., 105 S. 12 St., Phila., Pa., 1 story, 240x300 ft., steel frame, tile mfg. plant and power house. $250,000.

Pa., Phila.—PLANT—The Supplee Wills Jones Milk Co., H. Supplee, Jr., pres., 1523 N. 26 St., plans 80% completed milk processing and distr. plant, Tabor Rd. and Harrison St., $200,000; plans 40% completed expan. 47 St. plant, $250,000. Financing provided. CD 12/13—ENR 12/28.

★**Tex., La Porte**—PLANT—E. I. duPont de Nemours & Co., 2219 McKinney St., Houston, and La Porte, plans under way constructing, equip. chemical plant, $50,000,000. Rust Engineering Co., La Porte, consult. engr. CD 10/5—ENR 10/19.

Tex., Port Isabel — PLANT — Technical Fisheries Co., 1332 Evans Ave., San Francisco, Calif., and J. L. Kline, Port Isabel, plans 50% completed plant for extraction and mfg. shark oil. Over $40,000. Funds available. CD 4/27—ENR 5/4, under Industrial.

READY FOR BIDS

Mass., Norwood—PLANT—Plimpton Press, Lenox St., plans completed by H. J. Korslund, 153 Nahatan St., 3 story, brick plant addn., Lennox St. $45,000.

STREAMLINE

TRADE MARK REG. U. S. PAT. OFFICE

COPPER PIPE AND FITTINGS

FOR PIPING *Permanence*

Water works officials who are responsible for the return on on a very heavy capital investment have in STREAMLINE Copper Pipe, one of the most effective and low cost forms of insurance that they can adopt. It is the ideal material for water service work.

STREAMLINE Fittings are not connected by threading or flaring the pipe but by an entirely new and revolutionary method that utilizes nature's law, capillary attraction, to form one of the tighest and strongest joints known to the trade.

STREAMLINE Copper Pipe cannot rust and since it is not connected by threading, the wall need not be so heavy. Pipe which is threaded to connect must have a much heavier wall because the thread diminishes its thickness and the strength of the pipe is therefore limited to this diminished wall thickness, while on the balance of the pipe expensive surplus material remains, but gives no extra service for its additional weight and consequent cost.

STREAMLINE Copper Pipe utilizes only that wall thickness required for actual service and the fitting actually reinforces the connection, making it the strongest point, while with threaded pipe it is the weakest.

A STREAMLINE service line is vibration proof. Settlement of filled earth or water mains, etc. does not affect it. STREAMLINE Fittings and Copper Pipe are the ideal materials for water works use; for many applications in filtration plants; in aeration lines and in heating coils using the sludge digestion system in sewage disposal plants—and for all general plumbing and heating purposes.

Plan to install STREAMLINE Copper Service Pipe for postwar use.

STREAMLINE
PIPE AND FITTINGS DIVISION
MUELLER BRASS CO.
PORT HURON, MICHIGAN

7½ MILLION CUBIC YARDS OF TOUGH OVERBURDEN "NON-STOP"

25-CUBIC-YARD PAGE *Automatic* AT WORK

The first 25-cubic-yard dragline bucket is a Page Automatic owned by the Northern Illinois Coal Corporation. It is shown at work, and below after its non-stop run of 7½ million cubic yards when it was sent to the yard for its first reconditioning.

SAME PAGE AUTOMATIC AFTER 7½ MILLION CUBIC YARDS OF STRENUOUS WORKOUT

PAGE ENGINEERING COMPANY · CHICAGO 38, ILLINOIS

EPPINGER AND RUSSELL CO.

Wood Preservers Since 1878

All kinds of Structural Timbers and Lumber Pressure Treated with Creosote Oil or

DU PONT CZC Chromated Zinc Chloride

80 EIGHTH AVE., NEW YORK, N. Y.

POLES, CROSS ARMS, PILING, TIES POSTS, BRIDGE and DOCK TIMBERS

TREATING PLANTS

Jacksonville, Fla. Norfolk, Va.
Long Island City, N. Y.

POWER SHOVELS AND CRANES

THE **BYERS** MACHINE COMPANY

RAVENNA, OHIO

DISTRIBUTORS THROUGHOUT THE WORLD

POSTWAR PROJECTS (Cont'd.)

Tex., Amarillo—WAREHOUSE—Fuqua Food Stores, Amarillo, plans completed by J. Roy Smith, Blackburn Bldg., 1 story, 140x200 ft., brick, stone, concrete warehouse, $100,000. Financing available. CD 12/6—ENR 12/16 under Industrial.

CONTRACTS AWARDED

Wis., Beloit—DIESEL ENGINE SHOP—Fairbanks, Morse & Co., Lawton Ave., 1 story, 80x200 ft., structural steel, metal siding diesel engine shop, concrete fdn., to Cunningham Bros., 359 E. Grand Ave., Beloit. F. Fred Dolke, 188 W. Madison St., Chicago, Ill., consult. engr. CD 5/17—ENR 6/1.

UNCLASSIFIED

PROPOSED WORK

Calif., Riverside—SWIMMING POOL, etc.—City, swimming pool, $75,000; bleachers, $100,000, at high school.

Mass., Danvers—ATHLETIC FIELD—Town, Town Clerk, Town Hall, athletic field, war memorial, baseball, football facilities. Over $25,000. Financing not provided.

Mich., Clare—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mich., Coldwater—AIRPORT—City, grading, lighting airport. $304,000. CAA will help finance.

Mich., Dowagiac—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mich., Durand—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mich., East Lansing—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mich., East Tawas—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mich., Evart—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mich., Sturgis—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Mich., Three Rivers — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance.

Mich., Vassar — AIRPORT — City, grading airport. $25,000. CAA will help finance.

Mich., Vulcan — AIRPORT — City, grading airport. $25,000. CAA will help finance.

Mich., West Branch—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mich., Whitehall—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mich., Yale — AIRPORT — City, grading airport. $25,000. CAA will help finance.

Mich., Ypsilanti—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Minn., Albert Lea — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Anoka—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Appleton—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Beaver Bay — AIRPORT — City, grading airport. $25,000. CAA will help finance.

Minn., Bemidji—AIRPORT—City, lighting airport. $32,000. CAA will help finance.

Minn., Breckinridge — AIRPORT — City, grading airport. $25,000. CAA will help finance.

Minn., Cloquet—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Deephaven (mail Excelsior)—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Duluth—AIRPORT—City, grading, lighting airport. $55,000. CAA will help finance.

Minn., Ely — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Forest Lake — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Fosston—AIRPORT—City, H. V. Carlin, clk., Class 1 airport. $25,000.

Minn., Frontenac—AIRPORT—City, grading, paving, lighting airport. $365,000. CAA will help finance.

Minn., Grand Marais — AIRPORT — City, grading, airport. $25,000. CAA will help finance.

Minn., Grand Rapids—AIRPORT—City, grading, lighting airport. $365,000. CAA will help finance. CD 2/1/43—ENR 2/4/43.

Minn., Hastings—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

Minn., Hopkins—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Minn., Hutchinson—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance. CD 9/13—ENR 9/21.

Minn., International Falls—AIRPORT—City, paving, lighting airport. $115,000. CAA will help finance.

Minn., Ivanhoe—AIRPORT—Village, E. C. Gillis, clk., airport, $25,000.

WHAT HAS OTIS ELEVATOR COMPANY BEEN DOING?

...and what are they PREPARED to do?

The factories of the Otis Elevator Company have been devoted one hundred per cent to the war effort. That's not unique. That's the pattern of American industry.

however...

In addition to our large scale production of a great variety of highly precise mechanisms of war for the Army, Navy, and the Air Corps, we have continued to produce elevators. We have manufactured freight as well as passenger elevators for hospitals, ordnance depots, naval warehouses, and other priority installations.

this means...

Although our facilities, organization, and resources have enlisted for the duration and have gone all out for war production *as a matter of actual fact we have never been out of the business of manufacturing, installing, and servicing elevators.*

and so...

As our war work is reduced or terminated, this company is prepared — with no change in pace, and without missing a stride — to resume furnishing the highest quality elevators and escalators for all peacetime purposes.

Otis ELEVATOR COMPANY

OFFICES IN ALL PRINCIPAL CITIES

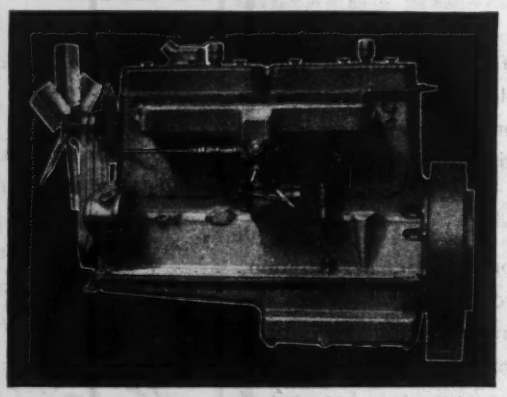
NO!

...not with

WAUKESHA POWER BEHIND THE PLOW

Neither snow in big drifts ten or twelve feet high, nor packed down almost rock-hard, can stop a Snow King Rotary Plow from clearing the highways. With its Waukesha Super Duty Six it's powered to push right through—cutting a clean, full-width swath —shooting the snow in a steady stream to either side of the road. Why do the plow makers, Imperial Machine Co., Minneapolis, use this Model 6-WAK Waukesha Engine? Because it has every modern design and construction feature . . . for maximum power and easier, more economical maintenance. Burns gasoline or butane. Six cylinders, 6¼ in. bore, 6½ in. stroke, 1197 cu. in. displacement. It's *the* engine for the super trucks and buses, oil field machinery, pumps, generators and other mobile industrial equipment of tomorrow. Get Bulletin 1138.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS. • NEW YORK • TULSA • LOS ANGELES



MORE POWER FOR VICTORY

WAUKESHA ENGINES

POSTWAR PROJECTS (Cont'd.)

Minn., Lake City—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Litchfield—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Luverne—AIRPORT—City, grading airport. $40,000. CAA will help finance. CD 10/18/43—ENR 10/21/43.

Minn., Madison—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Mankato—AIRPORT—City, grading, paving, lighting airport. $365,000. CAA will help finance.

Minn., Marshall—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Monticello—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Moorhead—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Minn., Morris—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., New Brighton—AIRPORT—City, grading, paving, lighting airport. $255,000. CAA will help finance.

Minn., Northfield—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Ossco—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Pine Island—ATHLETIC or RECREATION FIELD—Bd. Educ., G. Baumgartner, clk., athletic or recreation field, $50,000.

Minn., Preston—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Minn., Red Wing—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance. CD 2/1/43—ENR 2/4/43.

Minn., Redwood Falls—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Robbinsdale — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Rochester—AIRPORT—City, grading, paving, lighting airport. $126,000. CAA will help finance.

Minn., Roseau—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., Rosemont—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

Minn., St. Cloud—AIRPORT—City, grading, paving, lighting airport. $365,000. CAA will help finance.

Minn., St. James—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Shakopee—AIRPORT—City, grading, paving, lighting $304,000. CAA will help finance.

Minn., Slayton—AIRPORT—City, grading airport. $25,000. CAA will help finance. CD 9/20—ENR 10/5.

Minn., South Saint Paul—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

Minn., Stillwater—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Two Harbors—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Tyler—AIRPORT—Village, grading airport. $25,000. CAA will help finance. CD 9/20—ENR 10/5.

Minn., Virginia—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Wascca—AIRPORT—City, grading airport. $40,000. CAA will help finance.

Minn., Wheaton—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

Minn., Willmar—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

Minn., Willmar—ATHLETIC or RECREATION FIELD—Bd. Educ., A. C. Hedin, clk., athletic or recreation field, $40,000.

Minn., Worthington — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance. CD 2/1—ENR 2/4.

Miss., Ashland—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Batesville—AIRPORT—City, grading, lighting airport. $100,000. CAA will help finance.

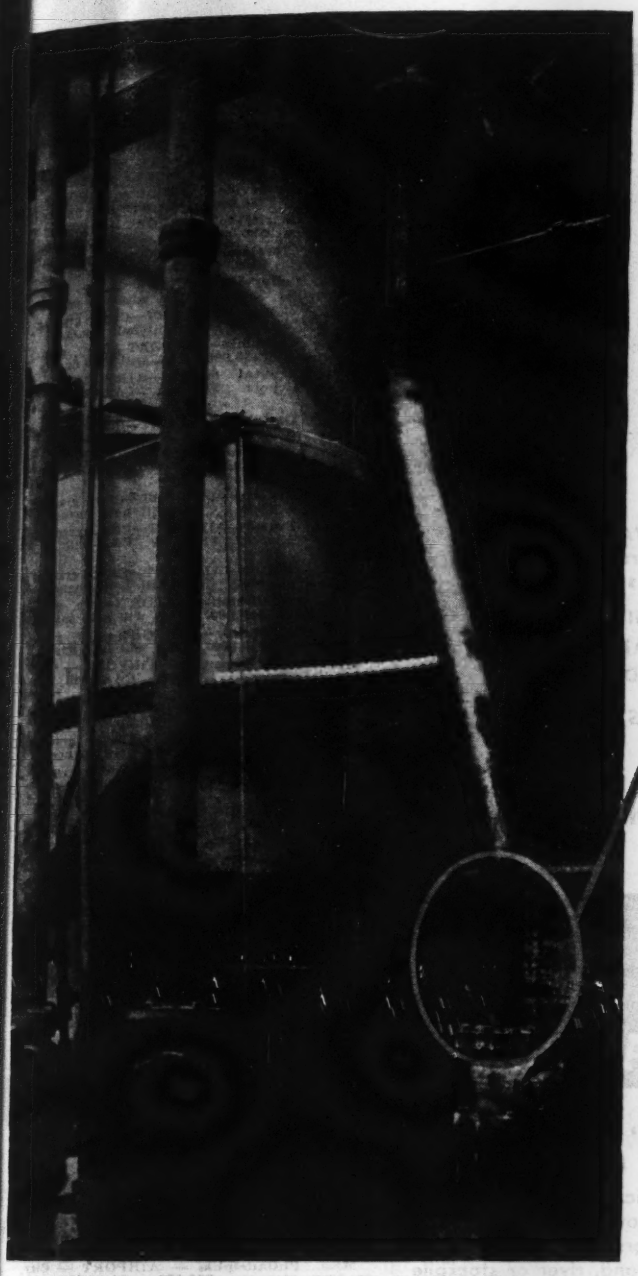
Miss., Bay Springs — AIRPORT — City, grading airport. $80,000. CAA will help finance.

Miss., Bay St. Louis—AIRPORT—City, grading airport. $130,000. CAA will help finance.

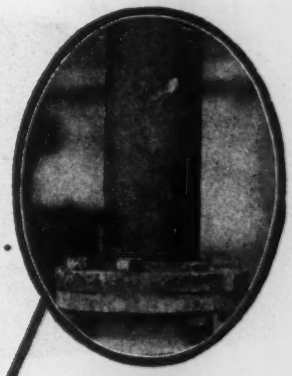
Miss., Belzoni—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Booneville—AIRPORT—City, grading, lighting airport. $80,000. CAA will help finance.

Miss., Brookhaven — AIRPORT — City, grading airport. $200,000. CAA will help finance.



Salt-encrusted equipment at the Ohio Salt Co. plant at Wadsworth, Ohio. The tail-water pipe, spotlighted where it enters the shutoff valve and magnified at the right above, is Yoloy, furnished by Hardware and Supply Company, Akron, Ohio.



Portrait of Yoloy Resisting a 3-Year Salt Attack

THIS Yoloy pipe has been in daily service in a corrosive salt atmosphere for over three years. It is the tail-water line handling condensate from the vacuum pan of a salt evaporator.

To the left you see the equipment "as is," encrusted with 3 years' accumulation of salt. Much of the piping, valves, tank, etc., is badly corroded.

Above is a closeup of the Yoloy pipe after the salt was removed. Note that it retains its perfection of threads, in fact, has the appearance of new pipe. That's because Yoloy is a nickel-copper steel, its remarkable ability to resist corrosion demonstrated in hundreds of instances like this.

Yoloy has many other valuable characteristics, too--extra strength, ability to withstand shock at low temperatures, great ductility, high weldability. Whenever you have the problem of selecting steel to meet adverse conditions, specify Yoloy. Yoloy is available now. Drop us a line ond our representative will be at your service.

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN 1, OHIO

Manufacturers of

Carbon, Alloy and Yoloy Steels

YOLOY YOUNGSTOWN STEEL

Pipe and Tubular Products - Sheets - Plates - Conduit - Bars - Electrolytic Tin Plate - Coke Tin Plate - Rods - Wire - Nails - Tie Plates and Spikes - Alloy and Yoloy Steels.

QUARRYING
MINING
OIL FIELDS

LOGGING

SNOW REMOVAL
EXCAVATING
Where grades are steep and snow is deep

FLEXIBLE TRACKS
Result In Maximum Traction

BUILT-IN POWER
BALCONED LOAD
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TRACTORS AND TRACK TRAILERS 5 TO 50 TONS CAPACITY

Send for Catalogue

THE LINN MANUFACTURING CORPORATION
MORRIS, NEW YORK

Big Savings
. . . IN HANDLING MATERIALS

Above is a light Sauerman Tautline Cableway pouring concrete for reservoir. Machine was rigged up first as a Slackline Cableway to make the excavation and then was converted into a conveying cableway to place the concrete.

Here is a ½ cu. yd. Sauerman Power Scraper dragging gravel out of wide pit to crusher that feeds a portable screening plant. Operating cost is about 5¢ per cubic yard handled.

Dig, Haul, Stockpile — at real low cost

Sauerman Scraper and Cableway machines are powerful excavators and rapid conveyors. They will reach across a pit, pond, river or stockpile or up to the top of a bank and move material from any point along the line of operation to any dumping point within a 1500-ft. radius at a speed of 400 to 600 f.p.m.

These machines are the product of 35 years of specialized experience in designing this type of equipment. Whether your problem is the handling of a few tons or many thousand tons per day we give you a machine that is economical and trouble-proof and easily operated by one man.

Write for Catalog

SAUERMAN BROS., Inc.
532 S. CLINTON ST. CHICAGO, 7

POSTWAR PROJECTS (Cont'd.)

Miss., Bude—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Calhoun Bay—AIRPORT — City, grading airport. $80,000. CAA will help finance.

Miss., Canton—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Carthage—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Centerville—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Charleston—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Cleveland—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Coffeyville—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Collins—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Columbia—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Crystal Springs—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., DeKalb—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Dupora-Walthall — AIRPORT — Cities, grading airport. $80,000. CAA will help finance.

Miss., Fayette—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Forest—AIRPORT—City, grading, lighting airport. $100,000. CAA will help finance.

Miss., Fulton—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Hazelhurst—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Hollandale—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Holly Springs — AIRPORT — City, grading airport. $80,000. CAA will help finance.

Miss., Houston—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Iuka—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Kosciusko—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Leaksville—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Lexington—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Louisville—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Lucedale—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Lula—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Lumberton—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Macon—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Marks—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Mendenhall—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Meridian—AIRPORT—City, grading airport. $140,000. CAA will help finance.

Miss., New Albany—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Newton—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Oxford—AIRPORT—City, grading airport. $250,000. CAA will help finance.

Miss., Pascagoula—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Philadelphia — AIRPORT — City, grading airport. $80,000. CAA will help finance.

Miss., Picayune—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Pontotoc—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Poplarville—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Port Gibson—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Prentiss—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Quitman—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Ripley—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Rolling Fork — AIRPORT — City, grading airport. $120,000. CAA will help finance.

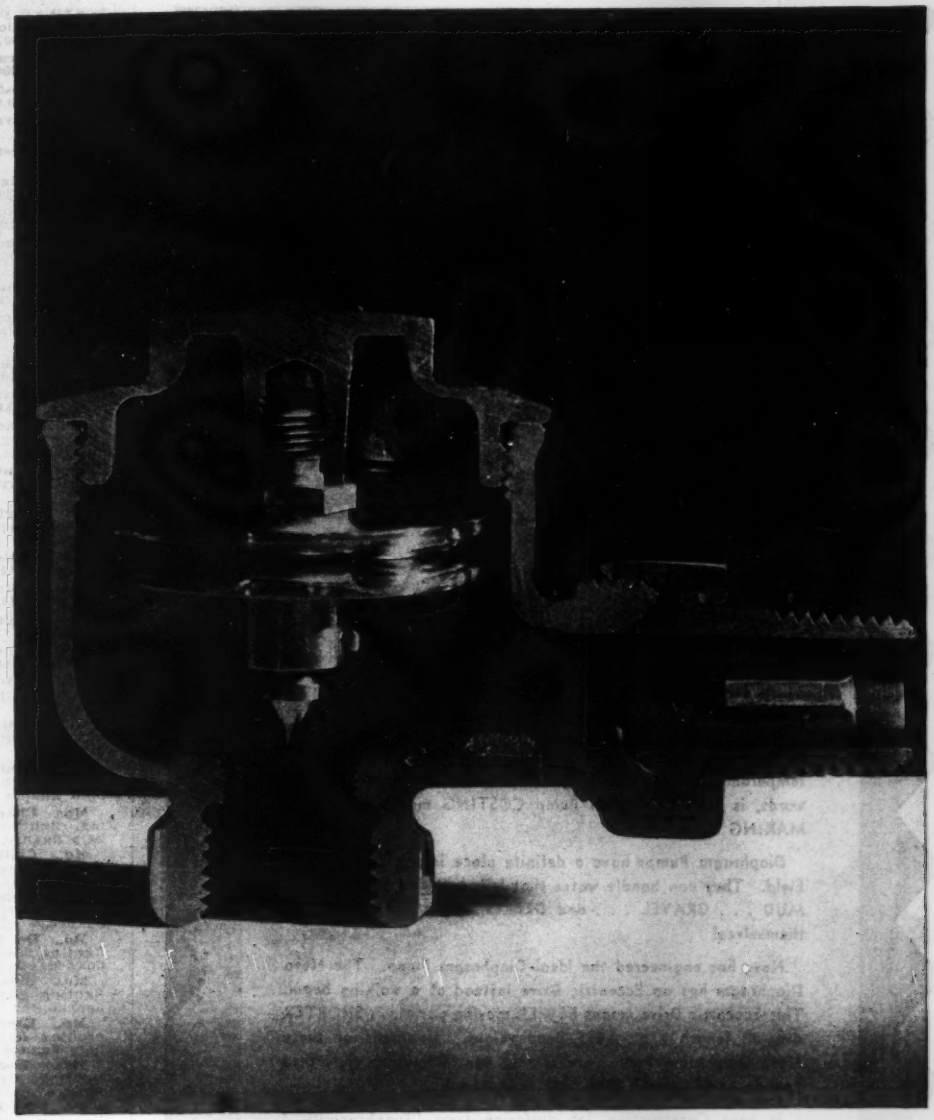
Miss., Rosedale—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Senatobia—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Sumner—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Sumrall—AIRPORT—City, grading airport. $50,000. CAA will help finance.

Miss., Tunica—AIRPORT—City, grading airport. $80,000. CAA will help finance.



Full Heat from Radiators

Webster Thermostatic Radiator Traps assure full heat from the steam delivered to radiators. There's no escape of "live" steam because Webster Traps allow only air and condensate to enter the returns. Designed for low pressure vapor and vacuum steam heating service, Webster Radiator Traps are noted for high efficiency and long service . . . Save fuel, save steam.

Available in three sizes—for 200 sq. ft., for 400 sq. ft., for 700 sq. ft. e.d.r. Webster Radiator Traps employ the time-tested Webster thermostatic element, a strong double diaphragm of phosphor bronze fully compensated for pressure. Maximum pressure is 25 lb. per. sq. in.

Webster Radiator Traps are extra heavy, extra rugged. Only the best of materials and workmanship are used in their manufacture. That's why Webster Traps are so easily able to withstand the severe service expected from heating equipment.

The features of today's Webster Traps are the result of more than 50 years steam heating experience. For full information on the longest-lasting traps available, consult your telephone directory for the address of the nearest Webster Representative. Or write us direct.

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Diaphragm Pumps have a definite place in the Construction Field. They can handle water that is laden with SLUDGE . . . MUD . . . GRAVEL . . . and DEBRIS WITHOUT damage to themselves!

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Is your Construction Job suffering from "Diaphragmitis"? Here's the cure . . . a NOVO DIAPHRAGM PUMP!

For full particulars about the Novo Diaphragm Pump, write us for Bulletin #167-C.

Associate Member of A.E.D.

NOVO ENGINE CO.

POSTWAR PROJECTS (Cont'd)

Miss., Union — AIRPORT — City, grading airport. $80,000. CAA will help finance.

Miss., Utica—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Vosburg—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Waynesboro—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., West Point—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Miss., Wiggins—AIRPORT—City, grading airport. $130,000. CAA will help finance.

Miss., Winona—AIRPORT—City, grading airport. $100,000. CAA will help finance.

Miss., Yazoo City—AIRPORT—City, grading, lighting airport. $255,000. CAA will help finance.

Mo., Albany — AIRPORT — City, grading airport. $34,000. CAA will help finance.

Mo., Aurora—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Bethany—AIRPORT—City, grading airport. $50,000. CAA will help finance.

Mo., Bolivar — AIRPORT — City, grading airport. $34,000. CAA will help finance.

Mo., Bonne Terre—AIRPORT—City, lighting, grading airport. $114,500. CAA will help finance.

Mo., Boonville—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Bowling Green — AIRPORT — City, grading airport. $34,000. CAA will help finance.

Mo., Butler — AIRPORT — City, grading airport. $34,000. CAA will help finance.

Mo., California—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Camdenton—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Cameron—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Carrollton—AIRPORT—City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Carthage—AIRPORT—City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Caruthersville — AIRPORT — City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Charleston—AIRPORT—City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Chillicothe—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Clinton — AIRPORT — City, grading, lighting airport. $114,500. CAA will help finance.

Mo., De Soto—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Eldon — AIRPORT — City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Excelsior Springs—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Festus—AIRPORT—City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Flat River—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Fulton—AIRPORT—City, grading, paving, lighting airport. $121,500. CAA will help finance.

Mo., Harrisonville—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Hermann—AIRPORT—City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Independence—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Jackson—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Joplin—AIRPORT—City, grading paving, lighting airport. $124,000. CAA will help finance.

Mo., Kennett—AIRPORT—City, grading, lighting airport. $44,000. CAA will help finance.

Mo., Kirksville—AIRPORT—City, grading, paving, lighting airport. $428,000. CAA will help finance.

Mo., Lamar—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Lebanon—AIRPORT—City, grading airport. $94,500. CAA will help finance.

Mo., Lees Summit—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Lexington—AIRPORT—City, grading, paving, lighting airport. $155,500. CAA will help finance.

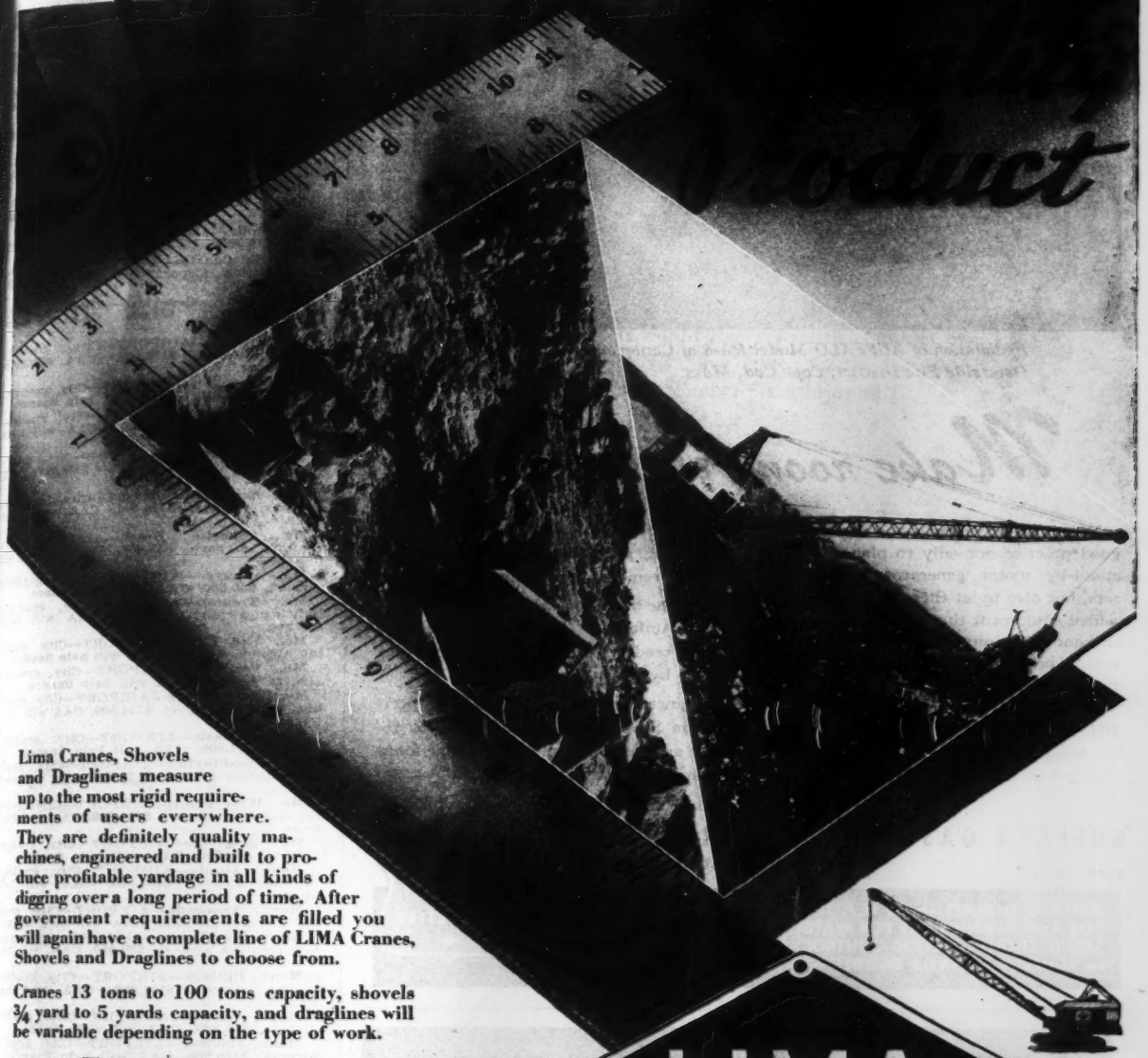
Mo., Liberty—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Louisiana—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Macon—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

LIMA

Product



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Cranes 13 tons to 100 tons capacity, shovels ¾ yard to 5 yards capacity, and draglines will be variable depending on the type of work.

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CRANES
13 TONS TO 100 TONS
DRAGLINES
VARIABLE

SHOVELS · DRAGLINES · CRANES

Installation of BUFFALO Model RA-8 at Centerville-Osterville Fire District, Cape Cod, Mass.

BUFFALO ENGINES
ASSURANCE of PROTECTION

Make room TO GROW IN

When laying out an installation, it's good practice not only to plan space for stand-by motor generator or pumping sets, but also to let there be room for the added equipment that future growth may demand. Ask any operating man whose motors are crowded in a narrow space between walls.

However, if the stand-by motor is a BUFFALO, things are not too bad. Years of designing motors for this service has resulted in their being most conveniently arranged for inspection and maintenance of wearing parts. Starting can be either manual, remote, or full automatic.

And the big point about Buffalo engines is their unfailing reliability—recognizable from a reading of their specifications and proven by years of service.

Engineers are invited to write for Specification Sheets for their files and to request any information that our experience in varied installations may afford.

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POSTWAR PROJECTS (Cont'd.)

Mo., Malden—AIRPORT—City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Marceline—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Maryville—AIRPORT—City, grading, lighting airport. $138,500. CAA will help finance.

Mo., Mexico—AIRPORT—City, grading, paving, lighting airport. $131,500. CAA will help finance.

Mo., Moberly—AIRPORT—City, grading, paving, lighting airport. $245,000. CAA will help finance.

Mo., Monett — AIRPORT — City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Mountain Grove—AIRPORT—City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Piedmont—AIRPORT—City, grading airport. $32,000. CAA will help finance.

Mo., Poplar Bluff—AIRPORT—City, grading, paving, lighting airport. $155,500. CAA will help finance.

Mo., Richmond—AIRPORT—City, grading lighting airport. $90,500. CAA will help finance.

Mo., Rolla—AIRPORT—City, lighting airport. $28,000. CAA will help finance.

Mo., St. Charles—AIRPORT—City, grading, lighting airport. $94,500. CAA will help finance.

Mo., St. Genevieve—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Salem—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Savannah—AIRPORT—City, grading, airport. $34,000. CAA will help finance.

Mo., Shelbina—AIRPORT—City, grading, lighting airport. $90,500. CAA will help finance.

Mo., Springfield—AIRPORT—City, grading, paving, lighting airport. $228,000. CAA will help finance.

Mo., Sullivan—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Sunrise Beach—AIRPORT—City, grading airport. $32,000. CAA will help finance.

Mo., Thayer—AIRPORT—City, grading airport. $50,000. CAA will help finance.

Mo., Trenton—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Van Buren—AIRPORT—City, grading airport. $32,000. CAA will help finance.

Mo., Versailles—AIRPORT—City, grading airport. $34,000. CAA will help finance.

Mo., Warrensburg—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Warsaw—AIRPORT—City, grading airport. $32,000. CAA will help finance.

Mo., Washington—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., West Plains—AIRPORT—City, grading, lighting airport. $114,500. CAA will help finance.

Mo., Woodville—AIRPORT—City, grading airport. $80,000. CAA will help finance.

Mont., Alzada—AIRPORT—City, grading lighting airport. $189,800. CAA will help finance.

Mont., Anaconda—AIRPORT—City, grading airport. $122,000. CAA will help finance.

Mont., Big Timber—AIRPORT—City, grading, lighting airport. $50,000. CAA will help finance.

Mont., Billings—AIRPORT—City, grading, paving airport. $174,000. CAA will help finance.

Mont., Birney—AIRPORT—City, grading airport. $52,900. CAA will help finance.

Mont., Boulder—AIRPORT—City, grading airport. $110,000. CAA will help finance.

Mont., Broadus—AIRPORT—City, grading airport. $172,400. CAA will help finance.

Mont., Browning—AIRPORT—City, grading, paving, lighting airport. $298,000. CAA will help finance.

Mont., Butte—AIRPORT—City, grading, paving airport. $98,000. CAA will help finance.

Mont., Chester—AIRPORT—City, grading airport. $50,000. CAA will help finance.

Mont., Chinook—AIRPORT—City, grading airport. $50,000. CAA will help finance.

Mont., Choteau—AIRPORT—City, grading airport. $125,000. CAA will help finance.

Mont., Circle—AIRPORT—City, grading airport. $127,000. CAA will help finance.

Mont., Columbus—AIRPORT—City, grading airport. $54,400. CAA will help finance.

Mont., Conrad—AIRPORT—City, grading airport. $169,000. CAA will help finance.

Mont., Culbertson—AIRPORT—City, grading airport. $109,000. CAA will help finance.

Mont., Custer—AIRPORT—City, grading, lighting airport. $50,000. CAA will help finance.

Down To the Sea in Timber

Timber Structures' field of service to the construction man, to the architect, to the engineer, is great.

Basically, our business is the fabrication of timber into structural form for various building uses. In the marine field, for example, this might mean heavy timbers for dry docks; trusses, beams, columns for shipyard buildings.

For any industry Timber Structures' service in fabricated trusses includes design, assembly, shipment, erection (if desired). Our facilities include fireproofing and preservative treatments.

Inquiries on present or future construction in wood and allied structural materials are welcomed. Our experience and performance on varied building assignments is a matter of record. If you would like a pictorial booklet of jobs we have done, simply ask your nearest Timber Structures office.

TIMBER STRUCTURES INCORPORATED

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Portland 8, Oregon
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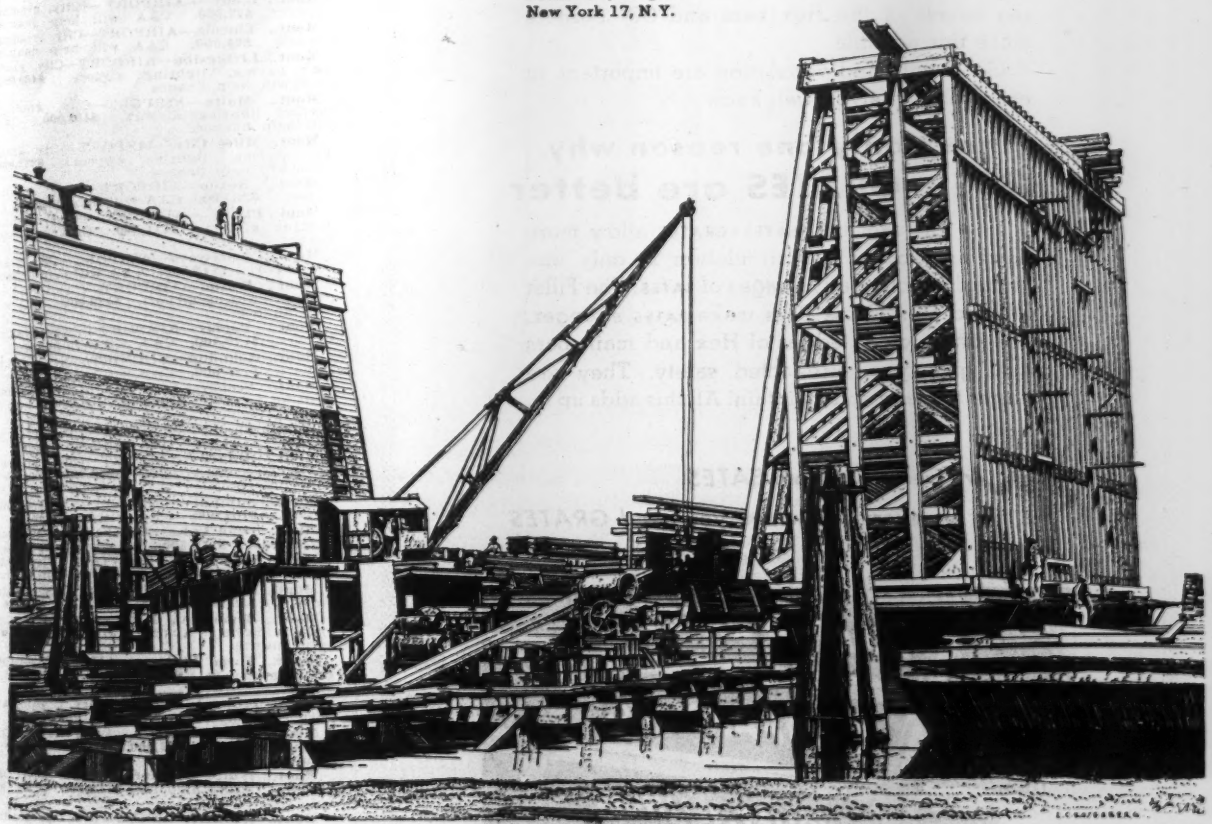

DRY DOCK. Heavy timber items fabricated by Timber Structures, Inc. were used to erect pontoons of the Portland, Oregon floating dry dock. Pen drawing by Louis C. Rosenberg, internationally known etcher and renderer. A copy suitable for framing will be mailed free to architects and engineers on professional letterhead request.

• *Mr. Fillet Weld* sees a lot of Mr. Sun. You see, *Mr. Fillet Weld* holds the Hex Cross Bars of BATES • GRATES to the main bars. In doing so, he allows maximum transmission of light and ventilation through the grating. The reflecting bevels of the Hex bars and 90° corners make this possible.

Good light and ventilation are important in every plant, as you well know.

that's only one reason why

BATES • GRATES are better

• The fact that BATES • GRATES allow more light and better air circulation is only one of the distinctive advantages of BATES. The Fillet Welded Hex Cross Bars make BATES stronger. The crisp, clean edges of Hex and main bars also give you sure-footed safety. They are easier to clean and maintain. All this adds up to:

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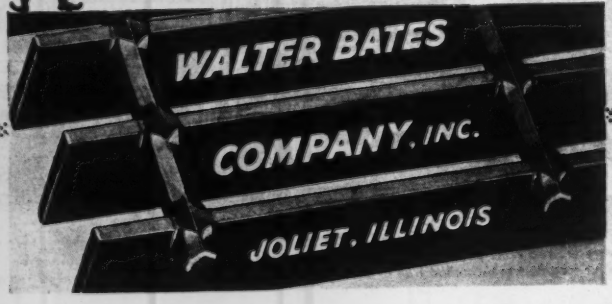


POSTWAR PROJECTS (cont'd.)

Mont., Dean—AIRPORT—City, grading airport. $132,000. CAA will help finance.

Mont., Deer Lodge—AIRPORT—City, grading airport. $63,800. CAA will help finance.

Mont., Dillon—AIRPORT—City, grading, paving, lighting airport. $169,500. CAA will help finance.

Mont., Dixon—AIRPORT—City, grading airport. $129,200. CAA will help finance.

Mont., Drummond—AIRPORT—City, grading, lighting airport. $[illegible],000. CAA will help finance.

Mont., Ekalka—AIRPORT—City, grading airport. $136,400. CAA will help finance.

Mont., Emigrant—AIRPORT—City, grading airport. $56,000. CAA will help finance.

Mont., Ennis — AIRPORT — City, grading airport. $59,500. CAA will help finance.

Mont., Eureka—AIRPORT—City, grading airport. $80,300. CAA will help finance.

Mont., Forsyth—AIRPORT—City, grading, lighting airport. $50,000. CAA will help finance.

Mont., Fort Benton — AIRPORT — City, grading airport. $50,000. CAA will help finance.

Mont., Gates Park — AIRPORT — City, grading airport. $125,000. CAA will help finance.

Mont., Geyser—AIRPORT—City, grading airport. $75,000. CAA will help finance.

Mont., Glacier Park — AIRPORT — City, grading airport. $70,000. CAA will help finance.

Mont., Glendive—AIRPORT—City, grading, paving, lighting airport. $117,000. CAA will help finance.

Mont., Hardin—AIRPORT—City, grading airport. $50,000. CAA will help finance.

Mont., Harlowtown — AIRPORT — City, grading airport. $101,400. CAA will help finance.

Mont., Havre—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Mont., Helena—AIRPORT—City, grading, paving, lighting airport. $127,000. CAA will help finance.

Mont., Ingomar—AIRPORT—City, grading airport. $86,000. CAA will help finance.

Mont., Jordan—AIRPORT—City, grading airport. $97,800. CAA will help finance.

Mont., Lavina—AIRPORT—City, grading airport. $75,000. CAA will help finance.

Mont., Libby — AIRPORT — City, grading airport. $72,500. CAA will help finance.

Mont., Lincoln—AIRPORT—City, grading airport. $94,000. CAA will help finance.

Mont., Livingston—AIRPORT—City, grading, paving, lighting airport. $169,000. CAA will help finance.

Mont., Malta—AIRPORT—City, grading, paving, lighting airport. $450,000. CAA will help finance.

Mont., Miles City—AIRPORT—City, grading, paving, lighting airport. $222,000. CAA will help finance.

Mont., Noxon—AIRPORT—City, grading airport. $96,000. CAA will help finance.

Mont., Plains — AIRPORT — City, grading, lighting airport. $111,800. CAA will help finance.

Mont., Plentywood—AIRPORT—City, grading airport. $113,000. CAA will help finance.

Mont., Polson—AIRPORT—City, grading, paving, lighting airport. $429,000. CAA will help finance.

Mont., Poplar—AIRPORT—City, grading airport. $179,400. CAA will help finance.

Mont., Roundup—AIRPORT—City, grading airport. $126,000. CAA will help finance.

Mont., Scobey—AIRPORT—City, grading, lighting airport. $139,000. CAA will help finance.

Mont., Shelby—AIRPORT—City, grading, airport. $166,000. CAA will help finance.

Mont., Sidney—AIRPORT—City, grading, paving lighting airport. $253,000. CAA will help finance.

Mont., Summit—AIRPORT—City, grading airport. $164,000. CAA will help finance.

Mont., Swan Lake—AIRPORT—City, grading airport. $111,000. CAA will help finance.

Mont., Sweetgrass—AIRPORT—City, grading airport. $50,000. CAA will help finance.

Mont., Terry — AIRPORT — City, grading airport. $50,000. CAA will help finance.

Mont., Thompson Falls—AIRPORT—City, grading, lighting airport. $154,200. CAA will help finance.

Mont., Three Forks — AIRPORT — City, grading airport. $50,000. CAA will help finance.

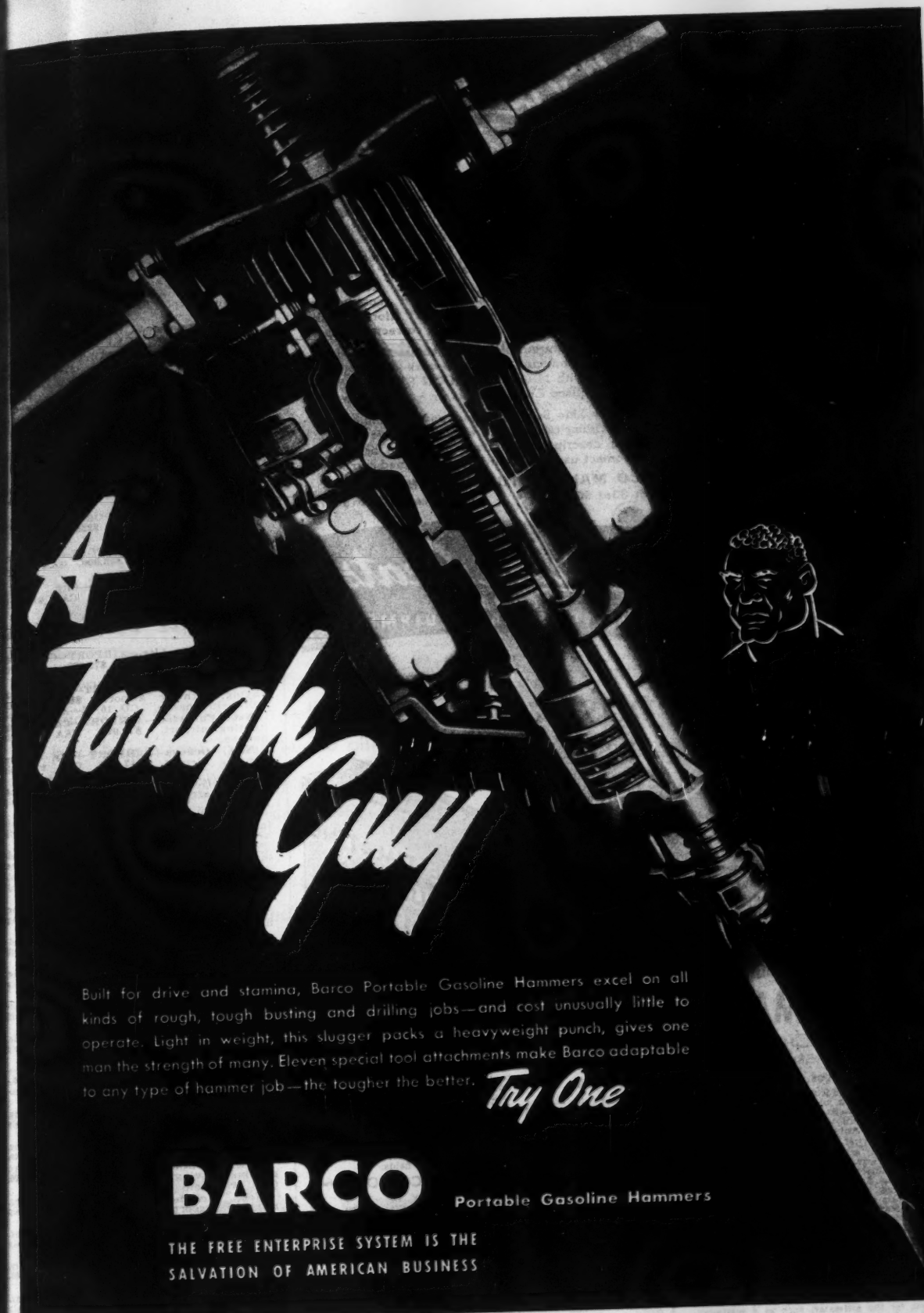
Mont., Troy—AIRPORT—City, grading airport. $75,000. CAA will help finance.

Mont., Twin Bridges — AIRPORT — City, grading airport. $62,000. CAA will help finance.

Mont., White Sulphur Springs—AIRPORT—City, grading airport. $116,000. CAA will help finance.

Mont., Winnett—AIRPORT—City, grading airport. $56,000. CAA will help finance.

Mont., Wisdom—AIRPORT—City, grading airport. $172,000. CAA will help finance.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Built for drive and stamina, Barco Portable Gasoline Hammers excel on all kinds of rough, tough busting and drilling jobs—and cost unusually little to operate. Light in weight, this slugger packs a heavyweight punch, gives one man the strength of many. Eleven special tool attachments make Barco adaptable to any type of hammer job—the tougher the better.
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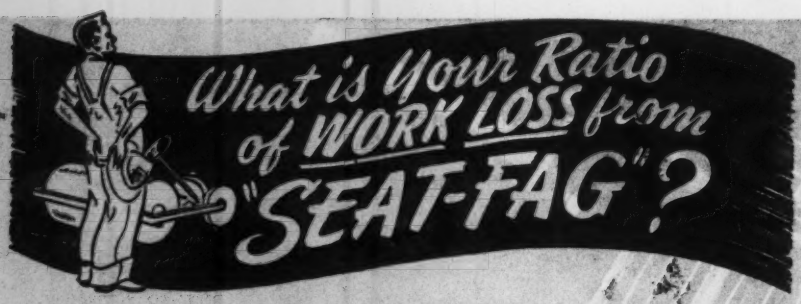

What is Your Ratio of WORK LOSS from "SEAT-FAG"?

You may never have thought of it in just these terms . . . but it is a fact that **SEAT FAG** is an important work-loss factor among operators of mobile equipment. At a time when manpower is at a premium, with rigid construction schedules to be met without delay, you can't afford to risk efficiency losses resulting from this easily corrected cause.

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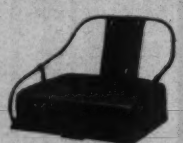
Our Milsco Victory Line Seat Cushions, now available, will add much to the riding comfort and efficiency of your operators. Write for descriptive literature and price list. DISTRIBUTORS: Contact us now regarding unassigned territory.



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Put this handy Dingman pocketbook to work, in making accurate estimates for building construction, in saving time and error in the job of determining profitable, competitive prices. Based on the most practical experience, it is full of helpful pointers for new or experienced estimators, shows how to determine quantities of labor and amounts of material to produce a unit of completed work in practically every branch of building construction.

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ESTIMATING BUILDING COSTS

By CHARLES F. DINGMAN
Architectural Engineer

401 pages, 4 x 6¾, 27 illustrations, $3.00

This practical guidebook of estimating trains the estimator to analyze every construction job into its component parts, to apply cost data, adjusted to living conditions, to the several operations necessary, and to calculate a price that will approach the actual cost of doing the work as closely as is humanly possible.

ESTIMATING BUILDING COSTS tells how to make an estimate on a wood, brick, or concrete building construction, and covers every operation from excavating to roofing and waterproofing —with valuable material on such important details as fireproof construction, shingling, steel sash, or cement gun work. Included also are a number of useful data tables, but its primary purpose is to give the step-by-step methods that will train the reader to become a thoroughly competent estimator. This book helps you to make sure that no element of the work is overlooked, and explains the special factors to watch in dealing with each type of work.

While essentially a book of methods, ESTIMATING BUILDING COSTS contains 227 data tables and other useful reference features for the estimator, such as a reminder list of job elements, and a number of practical mathematical formulas.

Practical features

- Covers earth handling and moving so fully that the data are applicable to building operations of practically any scope and size, also to other construction operations involving this work
- Contains extensively rewritten and expanded sections on handling and finishing concrete
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POSTWAR PROJECTS (Cont'd.)

Mont., Wolf Point—AIRPORT—City, grading, lighting airport. $100,000. CAA will help finance.

Neb., Ainsworth—AIRPORT—City, grading, lighting airport. $61,000. CAA will help finance.

Neb., Albion—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Alliance—AIRPORT—City, grading, lighting airport. $41,000. CAA will help finance.

Neb., Ashland—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Atkinson—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Auburn—AIRPORT—City, grading, lighting airport. $101,000. CAA will help finance.

Neb., Aurora—AIRPORT—City, grading, lighting airport. $51,000. CAA will help finance.

Neb., Bayard—AIRPORT—City, grading airport. $26,000. CAA will help finance.

Neb., Beatrice—AIRPORT—City, grading, paving, lighting airport. $211,000. CAA will help finance.

Neb., Blair—AIRPORT—City, grading airport. $26,000. CAA will help finance.

Neb., Broken Bow — AIRPORT — City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Central City—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Chadron—AIRPORT—City, grading, paving, lighting airport. $431,000. CAA will help finance.

Neb., Columbus—AIRPORT—City, grading, paving, lighting airport. $228,000. CAA will help finance.

Neb., Crawford—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Crete—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Fairbury—AIRPORT—City, grading, lighting airport. $51,000. CAA will help finance.

Neb., Falls City—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Fremont—AIRPORT—City, grading, paving, lighting airport. $101,000. CAA will help finance. CD 10/43—ENR 6/19/42.

Neb., Fullerton—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Geneva—AIRPORT—City, grading, lighting airport. $47,000. CAA will help finance.

Neb., Gordon—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Gothenburg—AIRPORT—City, grading, lighting airport. $61,000. CAA will help finance.

Neb., Hartington—AIRPORT—City, grading airport. $31,000. CAA will help finance.

Neb., Hastings—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance. CD 4/27—ENR 5/13.

Neb., Hebron—AIRPORT—City, grading, lighting airport. $61,000. CAA will help finance.

Neb., Holdredge—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Kimball—AIRPORT—City, grading, lighting airport. $108,000. CAA will help finance.

Neb., Lexington—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Lincoln—AIRPORT—City, grading, lighting airport. $49,000. CAA will help finance.

Neb., Lincoln—STREET LIGHTING, etc—City, City Hall, street lighting imprvs., $150,000; general park imprvs., $200,000; recreation and playground imprvs., $50,000.

Neb., McCook—AIRPORT—City, grading, lighting airport. $61,000. CAA will help finance.

Neb., Mitchell—AIRPORT—City, grading, airport. $25,000. CAA will help finance.

Neb., Nebraska City—AIRPORT—City, grading, paving, lighting airport. $268,000. CAA will help finance.

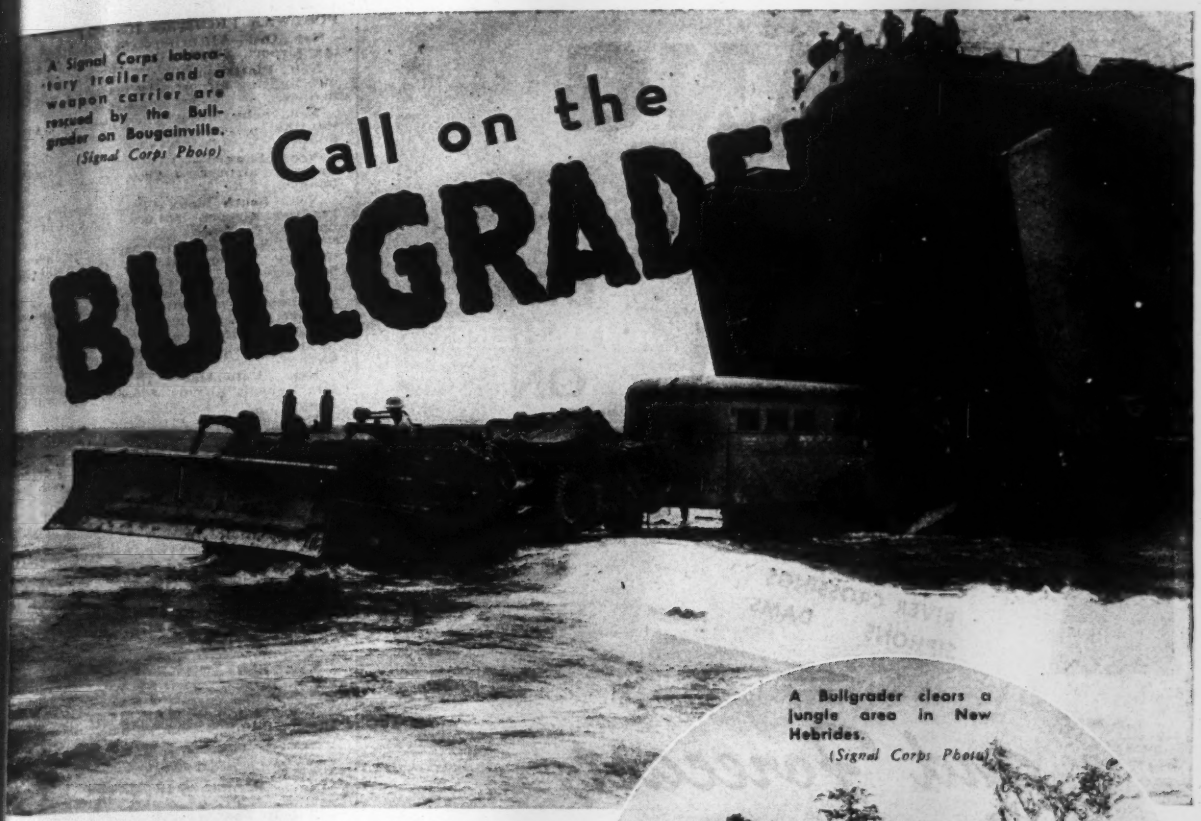
Neb., Neligh—AIRPORT—City, grading, lighting airport. $95,000. CAA will help finance.

Neb., Norfolk—AIRPORT—City, grading, lighting airport. $51,000. CAA will help finance.

Neb., North Platte—AIRPORT—City, grading, paving, lighting airport. $216,000. CAA will help finance.

Neb., O'Neill—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.

Neb., Ogallala—AIRPORT—City, grading, lighting airport. $73,000. CAA will help finance.



A Signal Corps laboratory trailer and a weapon carrier are rescued by the Bullgrader on Bougainville. *(Signal Corps Photo)*

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A Bullgrader clears a jungle area in New Hebrides. *(Signal Corps Photo)*

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This Bullgrader cleans up debris of a demolished Jap refinery. *(Signal Corps Photo)*

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POSTWAR PROJECTS (Cont'd.)

Neb., Ord—AIRPORT—City, grading, lighting airport. **$73,000.** CAA will help finance.

Neb., Plattsmouth—AIRPORT—City, grading, lighting airport. $11[illegible],000. CAA will help finance.

Neb., Schuyler—AIRPORT—City, grading, lighting airport. **$56,000.** CAA will help finance.

Neb., Seward—AIRPORT—City, grading, lighting airport. **$56,000.** CAA will help finance.

Neb., South Sioux City—AIRPORT—City, grading airport. **$34,000.** CAA will help finance.

Neb., Superior—AIRPORT—City, grading, lighting airport. **$73,000.** CAA will help finance.

Neb., Tecumseh—AIRPORT—City, grading, lighting airport. **$75,000.** CAA will help finance.

Neb., Thedford—AIRPORT—City, grading, lighting airport. **$56,000.** CAA will help finance.

Neb., Vallentine—AIRPORT—City, grading, lighting airport. **$76,000.** CAA will help finance.

Neb., Wayne—AIRPORT—City, grading, lighting airport. **$73,000.** CAA will help finance.

Neb., York—AIRPORT—City, grading, lighting airport. **$56,000.** CAA will help finance.

Nev., Battle Mountain—AIRPORT—City, grading, paving, lighting airport. **$416,400.** CAA will help finance.

Nev., Beatty—AIRPORT—City, grading airport. **$63,000.** CAA will help finance.

Nev., Delamar—AIRPORT—City, grading, paving, lighting airport. **$98,000.** CAA will help finance.

Nev., Elko—AIRPORT—City, grading, lighting, paving airport. **$140,500.** CAA will help finance.

Nev., Ely—AIRPORT—City, grading, paving, lighting airport. **$80,800.** CAA will help finance.

Nev., Eureka—AIRPORT—City, grading airport. **$40,200.** CAA will help finance.

Nev., Fallon — AIRPORT — City, grading, paving airport. **$27,000.** CAA will help finance.

Nev., Fernley—AIRPORT—City, grading, paving, lighting airport. **$105,500.** CAA will help finance.

Nev., Gerlach—AIRPORT—City, grading airport. **$38,900.** CAA will help finance.

Nev., Indian Springs — AIRPORT — City, lighting airport. **$40,000.** CAA will help finance.

Nev., Lahontan—AIRPORT—City, grading, paving, lighting airport. **$109,000.** CAA will help finance.

Nev., Lovelock—AIRPORT—City, grading, paving, lighting airport. **$167,000.** CAA will help finance.

Nev., Morman Mesa — AIRPORT — City, grading, paving, lighting airport. **$197,200.** CAA will help finance.

Nev., Ploche-Panaca—AIRPORT—Cities, grading airport. **$57,200.** CAA will help finance.

Nev., Reno — AIRPORT — City, grading, paving, lighting airport. **$130,500.** CAA will help finance.

Nev., Silver Peak—AIRPORT—City, grading airport. **$38,300.** CAA will help finance.

Nev., Sparks—AIRPORT—City, grading, paving, lighting airport. **$173,500.** CAA will help finance.

Nev., Wells — AIRPORT — City, grading, paving, lighting airport. **$367,300.** CAA will help finance.

Nev., Winnemucca—AIRPORT—City, grading, paving, lighting airport. **$137,000.** CAA will help finance.

Nev., Yerington—AIRPORT—City, grading, paving, lighting airport. **$432,000.** CAA will help finance.

N. H., Alton—AIRPORT—City, grading airport. **$150,000.** CAA will help finance.

N. H., Claremont—AIRPORT—City, grading, paving, lighting airport. **$88,000.** CAA will help finance.

N. H., Colebrook—AIRPORT—City, grading, paving, lighting airport. **$263,000.** CAA will help finance.

N. H., Concord—AIRPORT—City, grading, paving, lighting airport. **$95,000.** CAA will help finance.

N. H., Derry—AIRPORT—City, grading airport. **$147,000.** CAA will help finance.

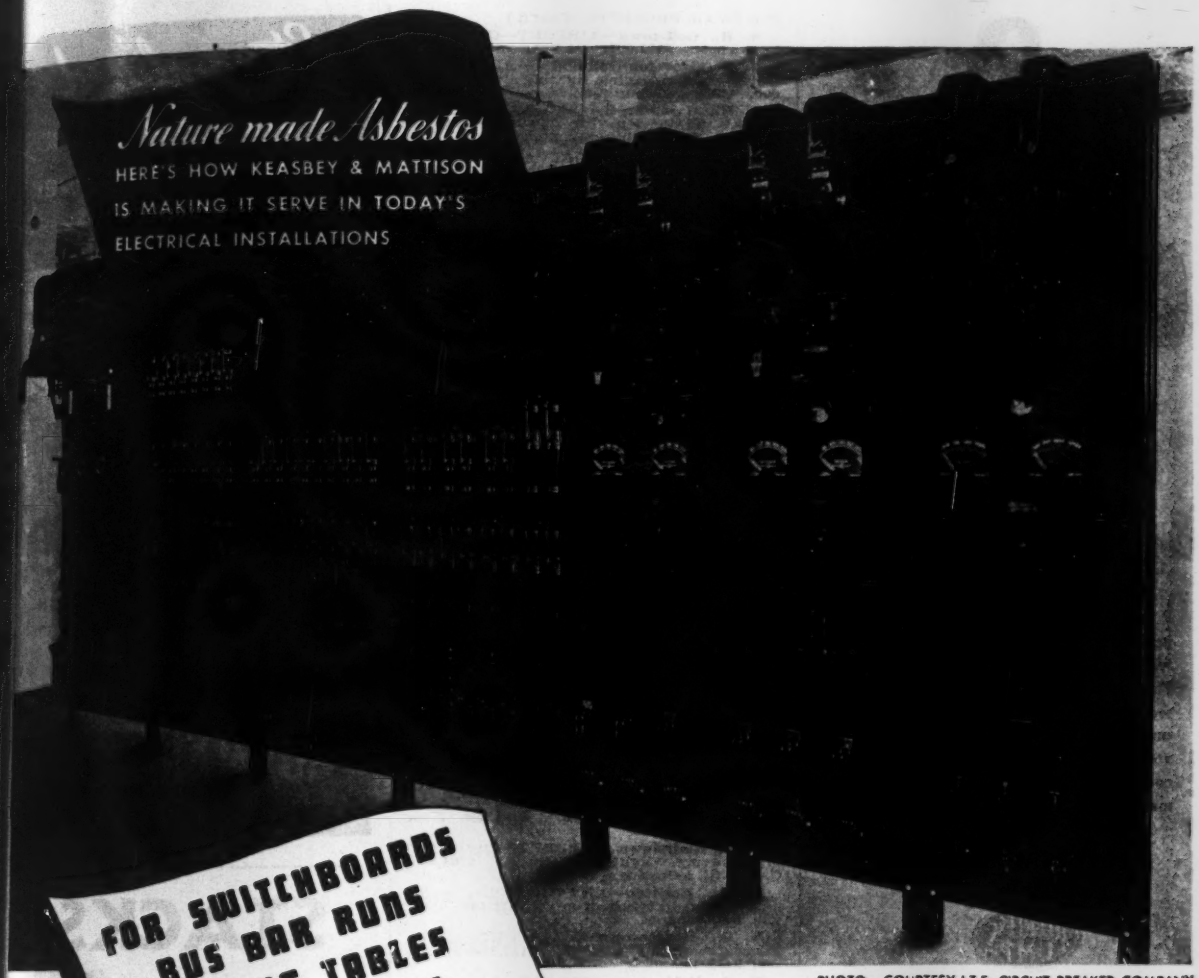
N. H., Durham—AIRPORT—City, grading airport. **$147,000.** CAA will help finance.

N. H., Errol — AIRPORT — City, grading, paving, lighting airport. **$255,000.** CAA will help finance.

N. H., Exeter—AIRPORT—City, grading airport. **$206,000.** CAA will help finance.

N. H., Franconia—AIRPORT—City, grading, paving, lighting airport. **$192,000.** CAA will help finance.

N. H., Franklin-Tilton—AIRPORT—Cities, grading airport. **$177,000.** CAA will help finance.



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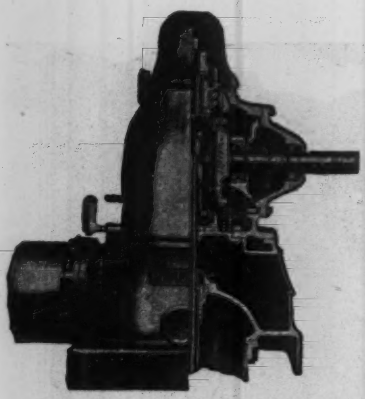

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POSTWAR PROJECTS (Cont'd.)

N. H., Goffstown—AIRPORT—City, grading airport. $138,000. CAA will help finance.

N. H., Groveton-Guildhal — AIRPORT — Cities, grading, paving, lighting airport. $473,000. CAA will help finance.

N. H., Hampton-Rye Beach—AIRPORT—Cities, grading, paving, lighting airport. $483,000. CAA will help finance.

N. H., Keene—BROADCASTING STATION—Monadnock Radio Fdn., Inc., Keene, broadcasting station, frequency modulation facilities bldg., towers, etc., Mt. Monadnock. $50,000.

N. H., Lancaster—AIRPORT—City, grading airport. $157,000. CAA will help finance.

N. H., Lebanon—AIRPORT—City, grading, paving, lighting airport. $142,000. CAA will help finance.

N. H., Littleton—AIRPORT—City, grading airport. $162,000. CAA will help finance.

N. H., Meredith—AIRPORT—City, grading airport. $167,000. CAA will help finance.

N. H., Milford—AIRPORT—City, grading airport. $187,000. CAA will help finance.

N. H., Newport—AIRPORT—City, grading, paving, lighting airport. $479,000. CAA will help finance.

N. H., Peterboro—AIRPORT—City, grading airport. $187,000. CAA will help finance.

N. H., Pittsfield—AIRPORT—City, grading airoort. $187,000. CAA will help finance.

N. H., Plymouth—AIRPORT—City, grading, paving, lighting airport. $377,000. CAA will help finance. CD 10/6/43—ENR 10/14/43.

N. H., Portsmouth — AIRPORT — City, lighting airport. $97,000. CAA will help finance.

N. H., Rochester—AIRPORT—City, grading, paving, lighting airport. $473,000. CAA will help finance.

N. H., Twin Mountain—AIRPORT—City, grading airport. $187,000. CAA will help finance.

N. H., Wakefield—AIRPORT—City, grading airport. $199,000. CAA will help finance.

N. H., Winchester—AIRPORT—City, grading airport. $267,000. CAA will help finance.

N. J., Atlantic City—AIRPORT—City, grading, paving, lighting airport. $331,050.

N. J., Bergenfield—AIRPORT—City, grading, paving, lighting airport. $394,800. CAA will help finance.

N. J., Blairstown—AIRPORT—City, grading, paving, lighting airport. $394,800. CAA will help finance.

N. J., Boonton—AIRPORT—City, grading, paving, lighting airport. $314,400. CAA will help finance.

N. J., Bordentown — AIRPORT — City, grading, lighting airport. $137,200. CAA will help finance.

N. J., Bridgeton—AIRPORT—City, grading, paving, lighting airport. $394,500. CAA will help finance.

N. J., Burlington—AIRPORT—City, grading, paving, lighting airport. $394,500. CAA will help finance.

N. J., Butler—AIRPORT—City, grading, lighting airport. $148,250. CAA will help finance.

N. J., Chatsworth—AIRPORT—City, grading, lighting airport. $106,803. CAA will help finance.

N. J., Clementon—AIRPORT—City, grading, paving, lighting airport. $376,550. CAA will help finance.

N. J., Dover—AIRPORT—City, grading, paving, lighting airport. $410,500. CAA will help finance.

N. J., Englewood—AIRPORT—City, grading, paving, lighting airport. $412,650. CAA will help finance.

N. J., Flemington—AIRPORT—City, grading, paving, lighting airport. $394,500. CAA will help finance.

N. J., Franklin—AIRPORT—City, grading, lighting airport. $135,750. CAA will help finance.

N. J., Freehold—AIRPORT—City, grading, paving, lighting airport. $394,810. CAA will help finance.

N. J., Garfield—AIRPORT—City, grading, paving, lighting airport. $412,600. CAA will help finance.

N. J., Glassboro-Pitman—AIRPORT—Cities, grading, paving, lighting airport. $362,300. CAA will help finance.

N. J., Gloucester—AIRPORT—City, grading, paving, lighting airport. $394,800. CAA will help finance.

N. J., Hackensack—AIRPORT—City, grading, paving, lighting airport. $405,600. CAA will help finance.

N. J., Haddonfield—AIRPORT—City, grading, paving, lighting airport. $405,600. CAA will help finance.

N. J., Hammonton—AIRPORT—City, grading, paving airport. $360,180. CAA will help finance.

N. J., Jersey City—AIRPORT—City, grading, paving, lighting airport. $412,600. CAA will help finance.

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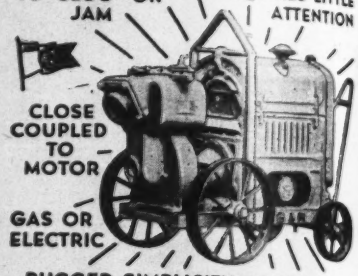

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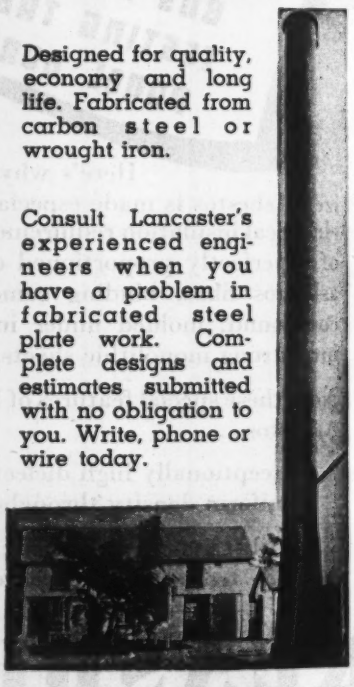

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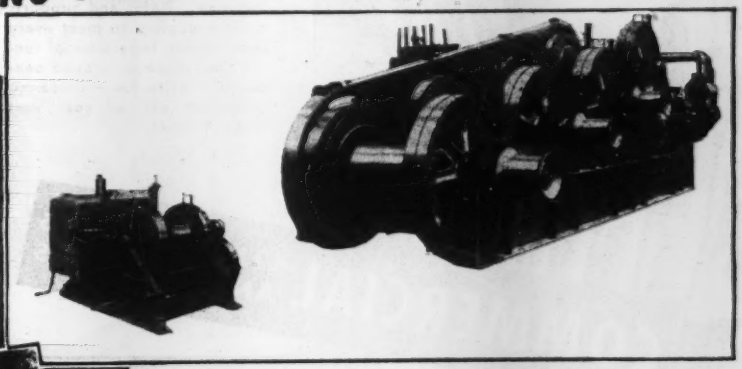

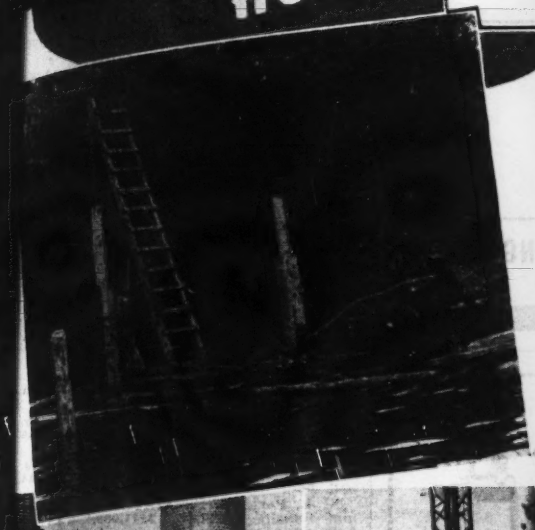

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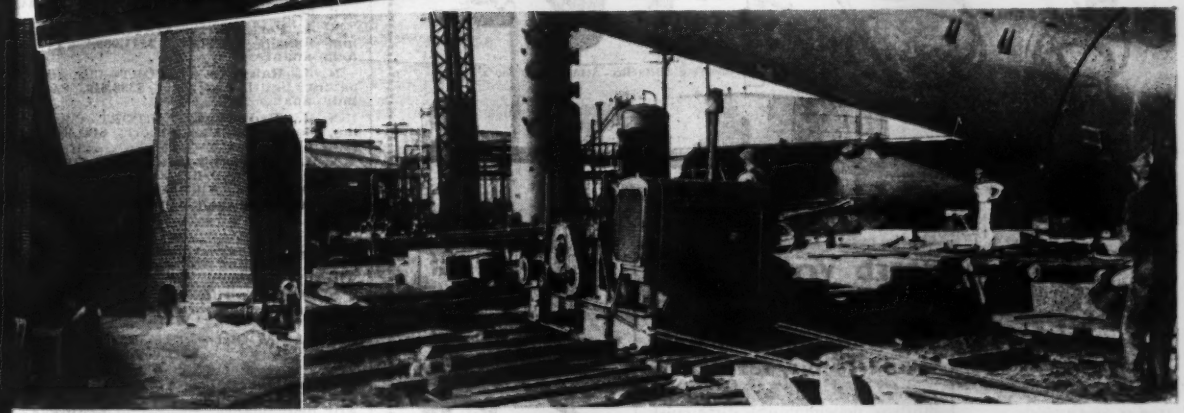

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POSTWAR PROJECTS (Cont'd.)

N. J., Keyport—AIRPORT—City, grading, lighting airport. $133,7[illegible] CAA will help finance.

N. J., Lambertville—AIRPORT—City, grading, lighting airport. $135,500. CAA will help finance.

N. J., Lincoln Park—AIRPORT—City, grading, lighting airport. $141,050. CAA will help finance.

N. J., Linden—AIRPORT—City, grading, paving, lighting airport. $219,800. CAA will help finance.

N. J., Long Branch—AIRPORT—City, grading, paving, lighting airport. $354,180. CAA will help finance.

N. J., Mays Landing—AIRPORT—City, grading airport. $126,490. CAA will help finance.

N. J., Metuchen—AIRPORT—City, grading, lighting airport. $123,490. CAA will help finance.

N. J., Montclair—AIRPORT—City, grading, paving, lighting airport. $429,400. CAA will help finance.

N. J., Morristown—AIRPORT—City, grading, lighting, paving airport. $300,000. CAA will help finance.

N. J., Mount Holly—AIRPORT—City, grading, paving, lighting airport. $377,500. CAA will help finance.

N. J., Netcong—AIRPORT—City, grading, lighting airport. $161,700. CAA will help finance.

N. J., New Egypt—AIRPORT—City, grading, lighting airport. $136,750. CAA will help finance.

N. J., Newton—AIRPORT—City, grading, paving, lighting airport. $464,070. CAA will help finance.

N. J., Ocean City—AIRPORT—City, grading, paving, lighting airport. $378,500. CAA will help finance.

N. J., Palmyra—AIRPORT—City, grading, lighting airport. $130,370. CAA will help finance.

N. J., Passaic—AIRPORT—City, grading, lighting, paving airport. $498,300. CAA will help finance.

N. J., Peapack-Gladstone — AIRPORT — Cities, grading, lighting airport. $158,000. CAA will help finance.

N. J., Perth Amboy — AIRPORT — City, grading, paving, lighting airport. $429,440. CAA will help finance.

N. J., Phillipsburg — AIRPORT — City, grading, paving, lighting airport. $456,790. CAA will help finance.

N. J., Plainfield—AIRPORT—City, grading, paving, lighting airport. $412,140. CAA will help finance.

N. J., Pleasantville — AIRPORT — City, grading, lighting airport. $126,490. CAA will help finance.

N. J., Pompton Lakes—AIRPORT—City, grading, lighting airport. $162,890. CAA will help finance.

N. J., Port Norris—AIRPORT—City, grading, lighting airport. $141,050. CAA will help finance.

N. J., Rahway—AIRPORT—City, grading, paving, lighting airport. $388,610. CAA will help finance.

N. J., Red Bank—AIRPORT—City, grading, paving, lighting airport. $405,500. CAA will help finance.

N. J., Ridgewood-Hawthorne—AIRPORT—Cities, grading, lighting, paving airport. $410,000. CAA will help finance.

N. J., Ringwood—AIRPORT—City, grading, lighting airport. $147,000. CAA will help finance.

N. J., Salem—AIRPORT—City, grading, paving, lighting airport. $350,000. CAA will help finance.

N. J., Sayreville—AIRPORT—City, grading, lighting airport. $142,000. CAA will help finance.

N. J., Sea Girt—AIRPORT—City, grading, lighting airport. $141,050. CAA will help finance.

N. J., Somerville—AIRPORT—City, grading, paving, lighting airport. $362,200. CAA will help finance.

N. J., South River — AIRPORT — City, grading, paving, lighting airport. $394,750. CAA will help finance.

N. J., Summit—AIRPORT—City, grading, paving, lighting airport. $405,500. CAA will help finance.

N. J., Sussex—AIRPORT—City, grading, lighting airport. $120,500. CAA will help finance.

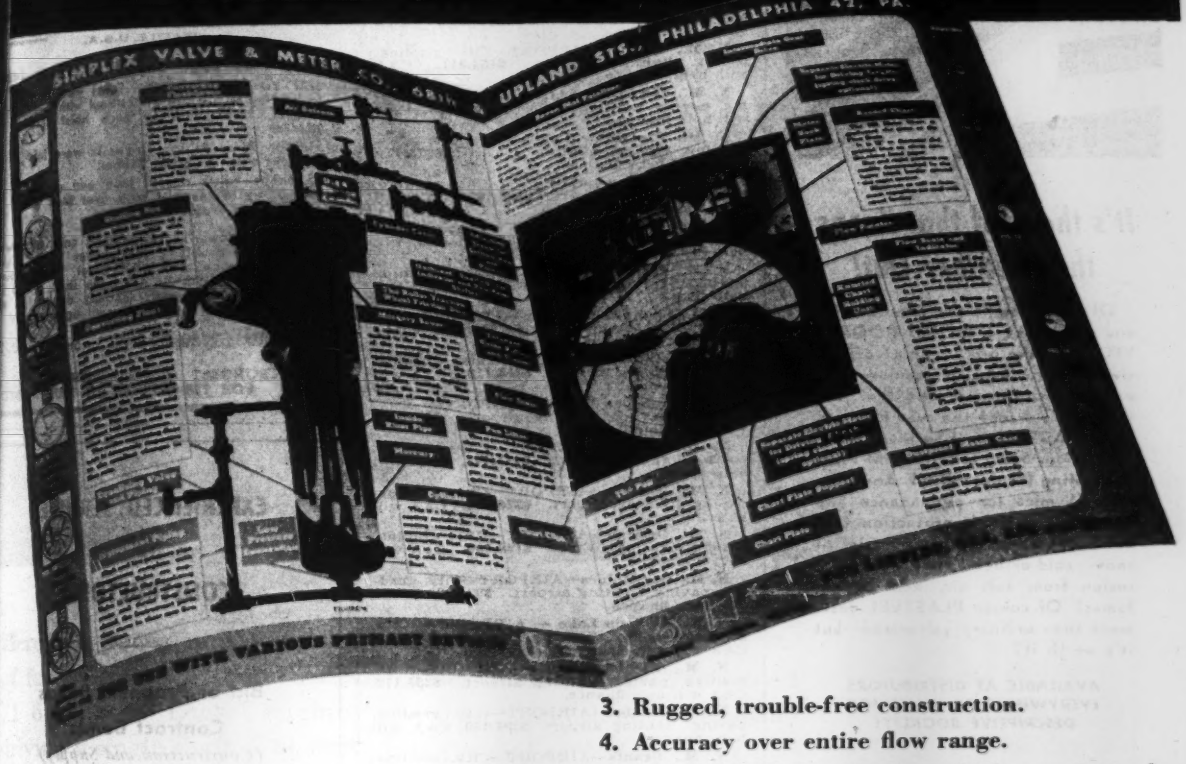
N. J., Toms River—AIRPORT—City, grading, paving, lighting airport. $376,000. CAA will help finance.

N. J., Tuckerton—AIRPORT—City, grading, lighting airport. $130,750. CAA will help finance.

N. J., Wantage—AIRPORT—City, grading, lighting airport. $120,500. CAA will help finance.

N. J., Washington—AIRPORT—City, grading, lighting airport. $148,250. CAA will help finance.

ACCURATE FLOW MEASUREMENT at LOW COST THE SIMPLEX MS METER



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POSTWAR PROJECTS (Cont'd.)

N. J., Westfield—AIRPORT—City, grading, lighting, paving airport. $412,500. CAA will help finance.

N. J., Westwood—AIRPORT—City, grading, lighting airport. $142,200. CAA will help finance.

N. J., Wildwood—AIRPORT—City, grading, lighting airport. $139,750. CAA will help finance. CD 5/10—ENR 5/18.

N. J., Williamstown — AIRPORT — City, grading, lighting airport. $125,000. CAA will help finance.

N. J., Woodbury—AIRPORT—City, grading, paving, lighting airport. $405,250. CAA will help finance.

N. M., Alamogordo — AIRPORT — City, grading, paving, lighting airport. $340,381. CAA will help finance.

N. M., Alamogordo Dam—AIRPORT—City, grading, paving, lighting airport. $272,160. CAA will help finance.

N. M., Anthony—AIRPORT—City, grading, paving, lighting airport. $196,746. CAA will help finance.

N. M., Artesia—AIRPORT—City, grading, paving, lighting airport. $331,500. CAA will help finance.

N. M., Aztec—AIRPORT—City, grading, paving, lighting airport. $136,345. CAA will help finance.

N. M., Bering—AIRPORT—City, grading, paving, lighting airport. $154,341. CAA will help finance.

N. M., Bernalillo—AIRPORT—City, grading, paving, lighting airport. $391,630. CAA will help finance.

N. M., Bluewater Lake—AIRPORT—City, grading, paving, lighting airport. $275,495. CAA will help finance.

N. M., Capitan—AIRPORT—City, grading, paving, lighting airport. $363,765. CAA will help finance.

N. M., Carlsbad—AIRPORT—City, grading, paving, lighting airport. $291,203. CAA will help finance.

N. M., Chama—AIRPORT—City, grading, paving, lighting airport. $279,521. CAA will help finance.

N. M., Chamita-Espanola—AIRPORT—Cities, grading, paving, lighting airport. $315,073. CAA will help finance.

N. M., Clovis—AIRPORT—City, grading, paving, lighting airport. $313,412. CAA will help finance.

N. M., Conchas Dam — AIRPORT — City, grading, paving, lighting airport. $477,675. CAA will help finance.

N. M., Corona—AIRPORT—City, grading, paving, lighting airport. $411,444. CAA will help finance.

N. M., Dawson—AIRPORT—City, grading, paving, lighting airport. $328,064. CAA will help finance.

N. M., Deming—AIRPORT—City, grading, paving, lighting airport. $128,700. CAA will help finance.

N. M., Des Moines—AIRPORT—City, grading, paving, lighting airport. $304,128. CAA will help finance.

N. M., El Vado Lake — AIRPORT — City, grading, paving, lighting airport. $343,620. CAA will help finance.

N. M., Elephant Butte—AIRPORT—City, grading, paving, lighting airport. $295,172. CAA will help finance.

N. M., Eunice—AIRPORT—City, grading, paving, lighting airport. $294,459. CAA will help finance.

N. M., Grants—AIRPORT—City, grading, paving, lighting airport. $385,957. CAA will help finance.

N. M., Hatch—AIRPORT—City, grading, paving, lighting airport. $293,084. CAA will help finance.

N. M., Hobbs—AIRPORT—City, grading, paving, lighting airport. $263,863. CAA will help finance.

N. M., Hope—AIRPORT—City, grading, paving, lighting airport. $280,522. CAA will help finance.

N. M., Hurley—AIRPORT—City, grading, paving, lighting airport. $245,168. CAA will help finance.

N. M., Jal—AIRPORT—City, grading, paving, lighting airport. $188,705. CAA will help finance.

N. M., Las Vegas—AIRPORT—City, grading, paving, lighting airport. $485,146. CAA will help finance.

N. M., Magdalena—AIRPORT—City, grading, paving, lighting airport. $137,269. CAA will help finance.

N. M., Melrose—AIRPORT—City, grading, paving, lighting airport. $316,239. CAA will help finance.

N. M., Mesilla Park—AIRPORT—City, grading, paving, lighting airport. $427,361. CAA will help finance.

N. M., Mogollon—AIRPORT—City, grading, paving, lighting airport. $469,447. CAA will help finance.

N. M., Mora—AIRPORT—City, grading, paving, lighting airport. $54,967. CAA will help finance.

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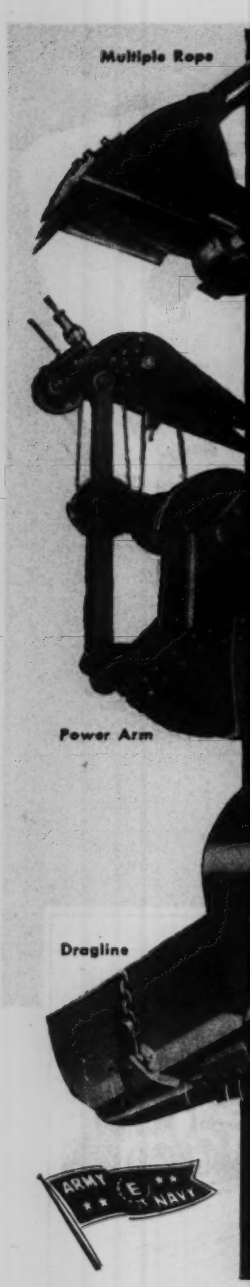

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POSTWAR PROJECTS (Cont'd.)

N. M., Mosquero—AIRPORT—City, grading, paving, lighting airport. $341,923. CAA will help finance.

N. M., Mountainair—AIRPORT—City, grading, paving, lighting airport. $332,671. CAA will help finance.

N. M., Nara Visa—AIRPORT—City, grading, lighting airport. $123,739. CAA will help finance.

N. M., Questa—AIRPORT—City, grading, lighting, paving airport. $345,471. CAA will help finance.

N. M., Raton—AIRPORT—City, grading, paving, lighting airport. $283,800. CAA will help finance.

N. M., Roswell—AIRPORT—City, grading, paving, lighting airport. $148,105. CAA will help finance.

N. M., Roy—AIRPORT—City, grading, paving, lighting airport. $325,743. CAA will help finance.

N. M., Ruidoso—AIRPORT—City, grading, paving, lighting airport. $260,238. CAA will help finance.

N. M., Santa Fe—AIRPORT—City, grading, paving, lighting airport. $271,962. CAA will help finance.

N. M., Santa Rita—AIRPORT—City, grading, paving, lighting airport. $168,531. CAA will help finance.

N. M., Shiprock—AIRPORT—City, grading, paving, lighting airport. $320,617. CAA will help finance.

N. M., Socorro—AIRPORT—City, grading, paving, lighting airport. $233,704. CAA will help finance.

N. M., Tierra Amarilla—AIRPORT—City, grading, paving, lighting airport. $409,429. CAA will help finance.

N. M., Tohatchi—AIRPORT—City, grading, paving, lighting airport. $441,595. CAA will help finance.

N. M., Tucumcari—AIRPORT—City, grading, paving, lighting airport. $287,870. CAA will help finance.

N. M., Tularosa—AIRPORT—City, grading, paving, lighting airport. $364,760. CAA will help finance.

N. M., Wagon Mound—AIRPORT—City, grading, paving, lighting airport. $260,120. CAA will help finance.

N. M., Willard—AIRPORT—City, grading, paving, lighting airport. $365,365. CAA will help finance.

N. M., Zuni—AIRPORT—City, grading, paving, lighting airport. $330,715. CAA will help finance.

N. Y., Albany—AIRPORT—City, grading, lighting airport $141,050; grading, paving, lighting airport, $243,200. CAA will help finance.

N. Y., Albion—AIRPORT—City, grading, lighting airport. $185,000. CAA will help finance.

N. Y., Amenia—AIRPORT—City, grading, paving, lighting airport. $393,760. CAA will help finance.

N. Y., Amityville—AIRPORT—City, grading, paving, lighting airport. $339,750. CAA will help finance.

N. Y., Arcade—AIRPORT—City, grading, lighting airport. $133,700. CAA will help finance.

N. Y., Babylon—AIRPORT—City, grading, paving, lighting airport. $346,080. CAA will help finance.

N. Y., Ballston Spa—AIRPORT—City, grading, paving, lighting airport. $330,350. CAA will help finance.

N. Y., Barker—AIRPORT—City, grading, lighting airport. $126,400. CAA will help finance.

N. Y., Batavia—AIRPORT—City, grading, paving, lighting airport. $380,180. CAA will help finance.

N. Y., Beacon—AIRPORT—City, grading, paving, lighting airport. $429,440. CAA will help finance.

N. Y., Benson Mines—AIRPORT—City, grading, lighting airport. $141,000. CAA will help finance.

N. Y., Blue Mountain Lake—AIRPORT—City, grading, lighting airport. $132,500. CAA will help finance.

N. Y., Boonville—AIRPORT—City, grading, paving, lighting airport. $394,810. CAA will help finance.

N. Y., Brockport—AIRPORT—City, grading, lighting airport. $135,000. CAA will help finance.

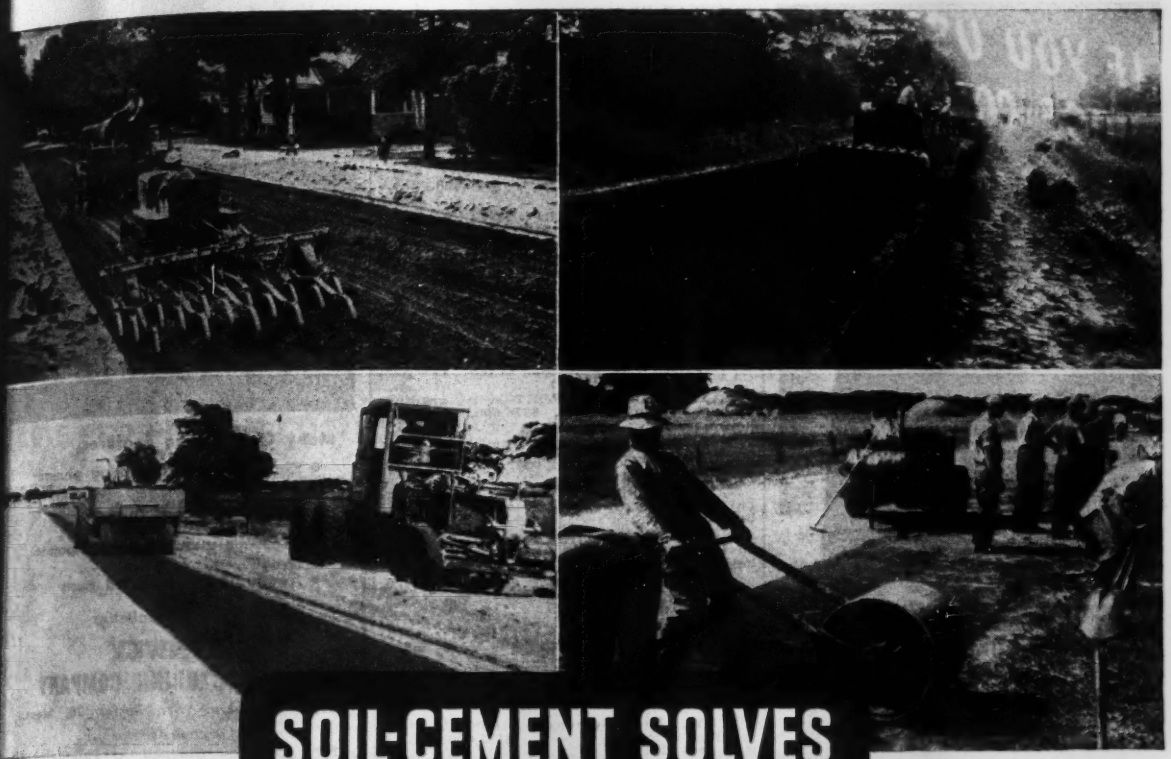
N. Y., Buffalo—AIRPORT—City, grading, paving, lighting airport. $382,500. CAA will help finance.

N. Y., Camden—AIRPORT—City, grading, lighting airport. $133,700. CAA will help finance.

N. Y., Canandaigua — AIRPORT — City, grading, paving, lighting airport. $370,450. CAA will help finance.

N. Y., Canasota—AIRPORT—City, grading, paving, lighting airport. $362,180. CAA will help finance.

N. Y., Canton—AIRPORT—City, grading, lighting airport. $133,170. CAA will help finance.



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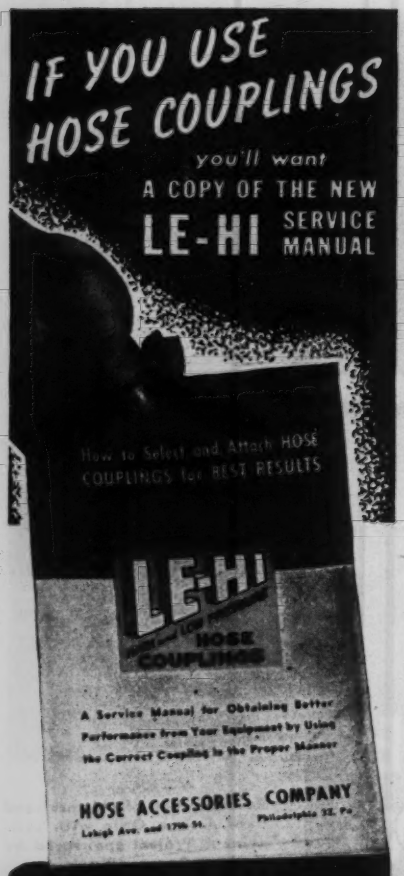
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POSTWAR PROJECTS (Cont'd.)

N. Y., Carmel-Brewster—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Carthage—AIRPORT—City, grading, paving, lighting airport. $377,500. CAA will help finance.

N. Y., Catskill—AIRPORT—City, grading, lighting airport. $488,170. CAA will help finance.

N. Y., Cazenovia—AIRPORT—City, grading, paving, lighting airport. $135,000. CAA will help finance.

N. Y., Chatham—AIRPORT—City, grading, lighting airport. $133,700. CAA will help finance.

N. Y., Cobleskill—AIRPORT—City, grading, paving, lighting airport. $394,810. CAA will help finance.

N. Y., Cohoes—AIRPORT—City, grading, paving, lighting airport. $420,000. CAA will help finance.

N. Y., Cooperstown — AIRPORT — City, grading, paving, lighting airport. $429,440. CAA will help finance.

N. Y., Corning—AIRPORT—City, grading, paving, lighting airport. $376,600. CAA will help finance.

N. Y., Dannemora—AIRPORT—City, grading, lighting airport. $149,500. CAA will help finance.

N. Y., Dansville—AIRPORT—City, grading, paving, lighting airport. $315,350. CAA will help finance.

N. Y., Dunkirk—AIRPORT—City, grading, paving, lighting airport. $282,850. CAA will help finance.

N. Y., East Aurora—AIRPORT—City, grading, lighting airport. $135,700. CAA will help finance.

N. Y., Easthampton — AIRPORT — City, grading, paving, lighting airport. $278,650. CAA will help finance.

N. Y., East Rochester—AIRPORT—City, grading, lighting airport. $141,030. CAA will help finance.

N. Y., East Syracuse—AIRPORT—City, grading, lighting airport $135,000. CAA will help finance.

N. Y., Ellensburg—AIRPORT—City, grading, lighting airport. $135,000. CAA will help finance.

N. Y., Ellenville—AIRPORT—City, grading, lighting airport. $142,000. CAA will finance.

N. Y., Elmira—AIRPORT—City, grading, paving airport. $27,550. CAA will help finance.

N. Y., Endicott—AIRPORT—City, grading, paving airport. $102,000. CAA will help finance.

N. Y., Fayetteville—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Franklinville — AIRPORT — City, grading, lighting airport. $120,000. CAA will help finance.

N. Y., Freeport—AIRPORT—City, grading, paving, lighting airport. $381,500. CAA will help finance.

N. Y., Fulton—AIRPORT—City, grading, paving, lighting airport. $318,900. CAA will help finance.

N. Y., Genesee—AIRPORT—City, grading, lighting airport. $132,400. CAA will help finance.

N. Y., Geneva—AIRPORT—City, grading, paving, lighting airport. $321,810. CAA will help finance.

N. Y., Glen Cove—AIRPORT—City, grading, paving, lighting airport. $385,000. CAA will help finance.

N. Y., Glens Falls—AIRPORT—City, grading, paving, lighting airport. $379,470. CAA will help finance.

N. Y., Gloversville—AIRPORT—City, grading, paving, lighting airport. $351,500. CAA will help finance.

N. Y., Gouverneur—AIRPORT—City, grading, paving, lighting airport. $372,600. CAA will help finance.

N. Y., Granville—AIRPORT—City, grading, lighting airport. $146,400. CAA will help finance.

N. Y., Greene—AIRPORT—City, grading, lighting airport. $135,000. CAA will help finance.

N. Y., Greenport—AIRPORT—City, grading, lighting, paving airport. $375,500. CAA will help finance.

N. Y., Hamburg—AIRPORT—City, grading, lighting airport. $135,200. CAA will help finance.

N. Y., Hamilton—AIRPORT—City, grading, paving, lighting airport. $350,000. CAA will help finance.

N. Y., Hammondsport—AIRPORT—City, grading, paving, lighting airport. $365,000. CAA will help finance.

N. Y., Hancock—AIRPORT—City, grading, paving, lighting airport. $345,000. CAA will help finance.

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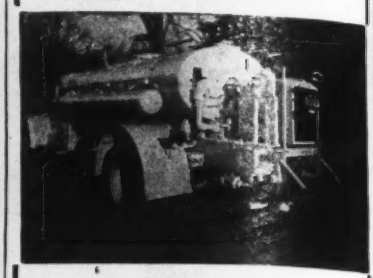

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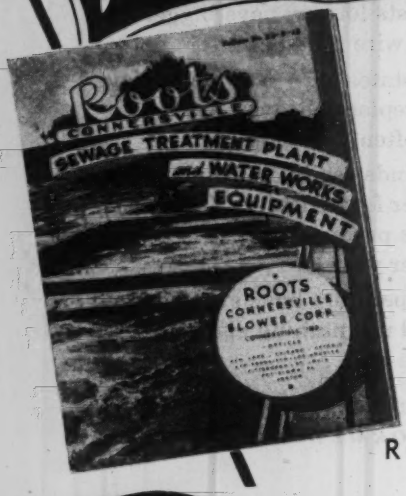

It gives much interesting and helpful information on positive displacement and centrifugal aerating blowers, positive displacement digester gas meters and filter vacuum pumps. The vital part played by air in sewage treatment is explained, together with the advantages of various types, drives etc. Typical "R-C" installations are also shown. We have a copy of Bulletin 23-B-12 for you.

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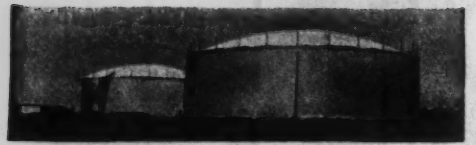
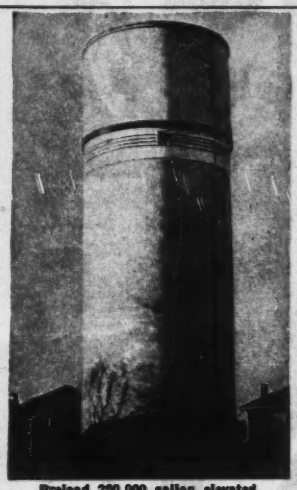
NO CORROSION - NO PAINTING

Entirely Built on the Site with Local Labor and Materials—Nationwide Service

Preload Dome, 155 feet diameter, covering 1,500,000 gallon reservoir



Preload 4,200,000 gallon fuel tanks.



Preload 200,000 gallon elevated water tank 36 feet diameter, 126 feet high.

Preload experience gained in hundreds of projects has made it possible to design with proper consideration of earth loads, foundations, shrinkage, temperature differences, plastic flow, working stresses, and all other factors which go into this type construction, to your most exacting requirements.

Write for list of Preload projects and illustrated bulletin "E."

THE PRELOAD CORP., 420 Lexington Ave., New York 17, N. Y.

BOSTON WASHINGTON MONTREAL

POSTWAR PROJECTS (Cont.)

N. Y., Haverstraw—AIRPORT—City, grading, paving, lighting airport. $443,000. CAA will help finance.

N. Y., Herkimer—AIRPORT—City, grading, paving, lighting airport. $440,000. CAA will help finance.

N. Y., Hilton—AIRPORT—City, grading, lighting airport. $135,000. CAA will help finance.

N. Y., Honeoye Falls—AIRPORT—City, grading, lighting airport. $[illegible],000. CAA will help finance.

N. Y., Hoosick Falls—AIRPORT—City, grading, lighting airport. $[illegible],000. CAA will help finance.

N. Y., Houghton—AIRPORT—City, grading, lighting airport. $142,000. CAA will help finance.

N. Y., Hudson—AIRPORT—City, grading, paving, lighting airport. $350,000. CAA will help finance.

N. Y., Huntington—AIRPORT—City, grading, paving, lighting airport. $328,000. CAA will help finance.

N. Y., Ilion—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Irondequoit—AIRPORT—City, grading, paving, lighting airport. $325,000. CAA will help finance.

N. Y., Jasper—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Johnstown—AIRPORT—City, grading, paving, lighting airport. $326,000. CAA will help finance.

N. Y., Keene—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Lake Placid—AIRPORT—City, grading, paving, lighting airport. $348,000. CAA will help finance.

N. Y., Lancaster—AIRPORT—City, grading, paving, lighting airport. $353,000. CAA will help finance.

N. Y., Liberty—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Little Falls—AIRPORT—City, grading, paving, lighting airport. $330,000. CAA will help finance.

N. Y., Lowville—AIRPORT—City, grading, paving, lighting airport. $345,000. CAA will help finance.

N. Y., Lyon Mountain—AIRPORT—City, grading, lighting airport. $188,000. CAA will help finance.

N. Y., Malone—AIRPORT—City, grading, paving, lighting airport. $300,000. CAA will help finance.

N. Y., Mamaroneck — AIRPORT — City, grading, paving, lighting airport. $394,810. CAA will help finance.

N. Y., Massena—AIRPORT—City, grading, paving, lighting airport. $241,000. CAA will help finance.

N. Y., Mechanicville—AIRPORT—City, grading, paving, lighting airport. $348,000. CAA will help finance.

N. Y., Medina—AIRPORT—City, grading, paving, lighting airport. $380,000. CAA will help finance.

★ **N. Y., Middletown** — AIRPORT — City, grading, paving, lighting airport. $972,450. CAA will help finance.

N. Y., Montauk—AIRPORT—City, grading, lighting airport. $135,000. CAA will help finance.

N. Y., Monticello—AIRPORT—City, grading, lighting airport. $147,500. CAA will help finance.

N. Y., Morovia—AIRPORT—City, grading, lighting airport. $141,050. CAA will help finance.

N. Y., Mount Kisco—AIRPORT—City, grading, lighting airport. $146,500. CAA will help finance.

N. Y., Mount Pleasant—AIRPORT—City, grading, lighting airport. $142,350. CAA will help finance.

N. Y., Mount Vernon—AIRPORT—City, grading, paving, lighting airport. $394,300. CAA will help finance.

N. Y., Naples-South Bristol (mail Canandaigua)—AIRPORT—Cities, grading, lighting airport. $120,000. CAA will help finance.

N. Y., Newark—AIRPORT—City, grading, paving, lighting airport. $262,200. CAA will help finance.

N. Y., North Creek— AIRPORT — City, grading, lighting airport. $132,500. CAA will help finance.

N. Y., Northville—AIRPORT—City, grading, paving, lighting airport. $395,700. CAA will help finance.

N. Y., Norwich—AIRPORT—City, grading, paving, lighting airport. $232,400. CAA will help finance.

N. Y., Nyack—AIRPORT—City, grading, lighting airport. $150,000. CAA will help finance.

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AND PLACE
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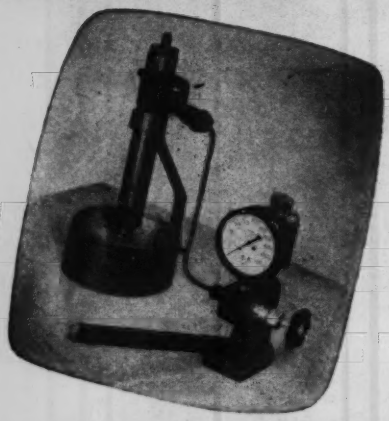

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POSTWAR PROJECTS (Cont'd.)

N. Y., Ogdensburg — AIRPORT — City, grading, paving, lighting airport. $377,400. CAA will help finance.

N. Y., Old Forge—AIRPORT—City, grading, lighting airport. $142,500. CAA will help finance.

N. Y., Oneida—AIRPORT—City, grading, paving, lighting airport. $350,000. CAA will help finance.

N. Y., Oneonta—AIRPORT—City, grading, paving, lighting airport. $379,300. CAA will help finance.

N. Y., Ossining—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Oswego—AIRPORT—City, grading, paving, lighting airport. $350,000. CAA will help finance.

N. Y., Owego—AIRPORT—City, grading, paving, lighting airport. $137,500. CAA will help finance.

N. Y., Pawling—AIRPORT—City, grading, lighting airport. $142,350. CAA will help finance.

N. Y., Peekskill—AIRPORT—City, grading, paving, lighting airport. $400,000. CAA will help finance.

N. Y., Penn Yan—AIRPORT—City, grading, paving, lighting airport. $385,200. CAA will help finance.

N. Y., Pine Plains—AIRPORT—City, grading, lighting airport. $135,000. CAA will help finance.

N. Y., Plattsburg—AIRPORT—City, imprv. airport. $25,000. CAA will help finance.

N. Y., Pleasantville—AIRPORT—City, grading, paving, lighting airport. $460,000. CAA will help finance.

N. Y., Port Jefferson—AIRPORT—City, grading, lighting airport. $122,200. CAA will help finance.

N. Y., Port Washington—AIRPORT—City, grading, lighting airport. $133,770. CAA will help finance.

N. Y., Portageville—AIRPORT—City, grading, lighting airport. $132,500. CAA will help finance.

N. Y., Potsdam—AIRPORT—City, grading, paving, lighting airport. $377,500. CAA will help finance.

N. Y., Red Creek—AIRPORT—City, grading, lighting airport. $129,570. CAA will help finance.

N. Y., Rhinebeck—AIRPORT—City, grading, lighting airport. $133,770. CAA will help finance.

N. Y., Riverhead—AIRPORT—City, grading, lighting, paving airport. $346,080. CAA will help finance.

N. Y., Rome—AIRPORT—City, grading, paving, lighting airport. $360,200. CAA will help finance.

N. Y., Rouses Point—AIRPORT—City, grading, lighting airport. $133,170. CAA will help finance.

N. Y., St. Regis Falls—AIRPORT—City, grading, lighting airport. $141,050. CAA will help finance.

N. Y., Salamanca—AIRPORT—City, grading, paving, lighting airport. $379,950. CAA will help finance.

N. Y., Salem—AIRPORT—City, grading, lighting airport. $129,570. CAA will help finance.

N. Y., Saranac Lake—AIRPORT—City, grading, paving, lighting airport. $457,650. CAA will help finance.

N. Y., Saratoga Springs—AIRPORT—City, grading, lighting airport. $133,770. CAA will help finance.

N. Y., Saugerties—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Sayville—AIRPORT—City, grading, lighting airport. $127,990. CAA will help finance.

N. Y., Schroon Lake—AIRPORT—City, grading, lighting airport. $133,770. CAA will help finance.

N. Y., Seneca Falls—AIRPORT—City, grading, paving, lighting airport. $346,080. CAA will help finance.

N. Y., Sidney—AIRPORT—City, grading, paving, lighting airport. $376,600. CAA will help finance.

N. Y., South Schenectady (mail Schenectady)—AIRPORT—City, grading, lighting airport. $152,000. CAA will help finance.

N. Y., Southampton — AIRPORT — City, grading, lighting airport. $127,990. CAA will help finance.

N. Y., Speculator—AIRPORT—City, grading, lighting airport. $120,000. CAA will help finance.

N. Y., Springville—AIRPORT—City, grading, lighting airport. $133,700. CAA will help finance.

N. Y., Stamford—AIRPORT—City, grading, lighting airport. $120,000. CAA will help finance.

N. Y., Sylvan Beach — AIRPORT — City, grading, lighting airport. $117,850. CAA will help finance.

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It is noteworthy that we were able quickly to take up our wartime tasks, and carry them through at top efficiency, without any major change from our peacetime tools and practices.

Bethlehem, engaged in recent years in building "arsenals of democracy," bridges of war, shipbuilding parts and subassemblies, and dozens of other types of fabricated steel construction, will again be at the service of American industry the moment commercial building is resumed.

Geared for speed and efficiency, and with a record of having built some of the nation's outstanding structures in record time in war and peace alike, Bethlehem can draw upon its mills and strategically-located fabricating works to handle construction in any part of the country. Builders planning postwar projects can count on Bethlehem to do the job—and do it fast at a time when speed will be important.

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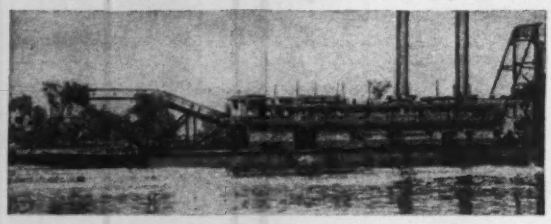

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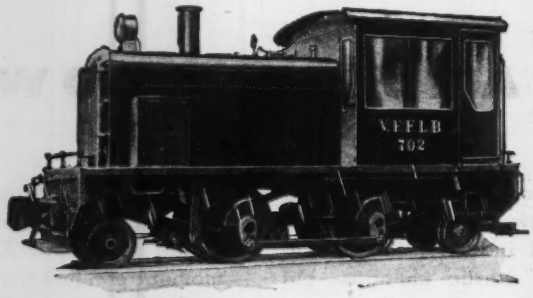

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POSTWAR PROJECTS (Cont'd.)

N. Y., Tarrytown—AIRPORT—City, grading, lighting, paving airport. $490,970. CAA will help finance.

N. Y., Ticonderoga—AIRPORT—City, grading, paving, lighting airport. $429,440. CAA will help finance.

N. Y., Tully — AIRPORT — City, grading, lighting airport. $135,000. CAA will help finance.

N. Y., Tupper Lake — AIRPORT — City, grading, lighting airport. $440,000. CAA will help finance.

N. Y., Walton—AIRPORT—City, grading, lighting airport. $94,000. CAA will help finance.

N. Y., Warsaw—AIRPORT—City, grading, lighting airport. $125,000. CAA will help finance. CD 2/4—ENR 2/11.

N. Y., Warwick—AIRPORT—City, grading, lighting airport. $87,000. CAA will help finance.

N. Y., Watertown—AIRPORT—City, lighting, imprv. airport. $76,000. CAA will help finance.

N. Y., Waverly—AIRPORT—City, grading, paving, lighting airport. $408,000. CAA will help finance.

N. Y., Wellsville—AIRPORT—City, grading, lighting airport. $98,000. CAA will help finance.

N. Y., Westfield—AIRPORT—City, grading, lighting airport. $60,000. CAA will help finance.

N. Y., Westhampton Beach—AIRPORT—City, grading, etc. airport. $80,000. CAA will help finance.

N. Y., West Lebanon — AIRPORT — City, grading, lighting airport. $160,000. CAA will help finance.

N. Y., Westport—AIRPORT—City, grading, lighting, paving airport. $383,000. CAA will help finance.

N. Y., Whitehall—AIRPORT—City, grading, paving, lighting airport. $423,000. CAA will help finance.

N. Y., Williamson—AIRPORT—City, grading, lighting airport. $135,000. CAA will help finance.

N. Y., Williamsville—AIRPORT—City, grading, lighting airport. $117,000. CAA will help finance.

N. C., Ahoskie-Aulander—AIRPORT—Cities, grading, etc. airport. $110,000. CAA will help finance.

N. C., Albemarle-Badin—AIRPORT—Cities, grading, lighting airport. $380,000. CAA will help finance.

N. C., Andrews-Murphy—AIRPORT—Cities, grading airport. $100,000. CAA will help finance.

N. C., Angier—AIRPORT—City, grading airport. $110,000. CAA will help finance.

N. C., Asheboro-Randleman—AIRPORT—Cities, grading, lighting airport. $380,000. CAA will help finance.

N. C., Belhaven—AIRPORT—City, grading airport. $110,000. CAA will help finance.

N. C., Boone—AIRPORT—City, grading airport. $110,000. CAA will help finance.

N. C., Brevard—AIRPORT—City, grading airport. $143,000. CAA will help finance.

N. C., Bryson City—AIRPORT—City, grading airport. $110,000. CAA will help finance.

N. C., Buxton-Cape Hatteras (mail Hatteras)—AIRPORT—Cities, grading airport. $110,000. CAA will help finance.

N. C., Canton-Waynesville—AIRPORT—Cities, grading, paving, lighting, airport. $260,000. CAA will help finance.

N. C., Carolina Beach—AIRPORT—City, grading airport. $160,000. CAA will help finance.

N. C., Carthage—AIRPORT—City, grading airport. $140,000. CAA will help finance.

N. C., Chapel Hill—AIRPORT—City, lighting, imprv. airport. $26,000. CAA will help finance.

N. C., Charlotte—AIRPORT—City, grading airport. $140,000. CAA will help finance.

N. C., Clinton—AIRPORT—City, grading airport. $110,000. CAA will help finance.

N. C., Columbia—AIRPORT—City, grading airport. $110,000. CAA will help finance.

N. C., Concord-Kannapolis—AIRPORT—Cities, grading, paving, lighting airport. $390,000. CAA will help finance.

N. C., Cullowhee-Sylva — AIRPORT — Cities, grading, lighting airport. $110,000. CAA will help finance.

N. C., Draper-Leaksville — AIRPORT — Cities, grading airport. $140,000. CAA will help finance.

N. C., Dunn-Erwin — AIRPORT — Cities, grading airport. $210,000. CAA will help finance.

N. C., Durham—AIRPORT—City, grading airport. $160,000. CAA will help finance.

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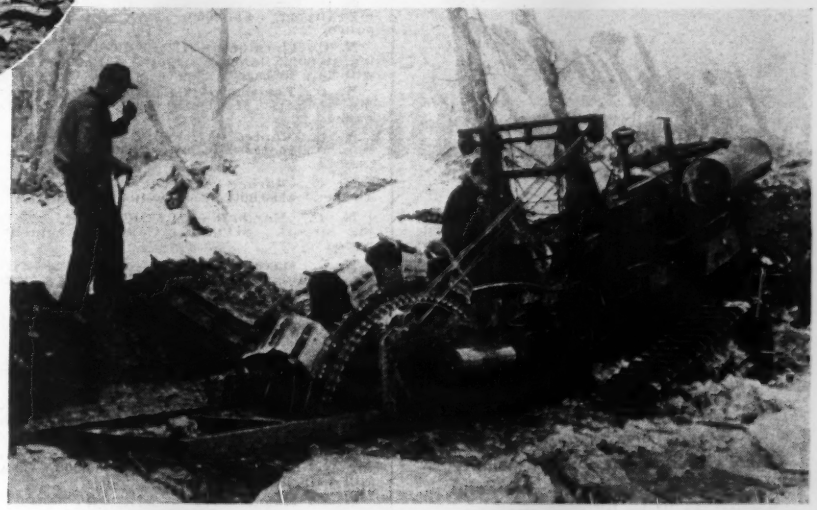

The picture at right shows a "CLEVELAND" digging through a frozen creek bottom and up a bank without a hitch, while digging at maximum depth. Such performance requires real ruggedness.

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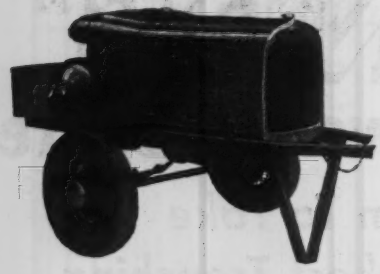

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POSTWAR PROJECTS (Cont'd.)

N. C., Edenton-Hertford — AIRPORT — Cities, grading airport. **$140,000.** CAA will help finance.

N. C., Elizabethtown — AIRPORT — City, grading airport. **$140,000.** CAA will help finance.

N. C., Farmville—AIRPORT—City, grading, lighting airport. **$140,000.** CAA will help finance.

N. C., Forest City-Spindale—AIRPORT—Cities, grading, paving, lighting airport. **$380,000.** CAA will help finance.

N. C., Franklin—AIRPORT—City, grading airport. **$110,000.** CAA will help finance.

N. C., Greensboro—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Greensboro-High Point—AIRPORT—Cities, grading, lighting, paving airport. **$300,000.** CAA will help finance.

N. C., Greenville—AIRPORT—City, grading, lighting airport. **$33,000.** CAA will help finance.

N. C., Henderson—RADIO STATION—Henderson Radio Corp., Henderson, constructing 250 watt standard radio station. Financing provided but plans incomplete.

N. C., Henderson-Oxford—AIRPORT—Cities, grading, lighting paving airport. **$450,000.** CAA will help finance.

N. C., High Point—AIRPORT—City, grading airport. **$110,000.** CAA will help finance.

N. C., Jonesville—AIRPORT—City, grading, paving, lighting airport. **$380,000.** CAA will help finance.

N. C., Kinston—AIRPORT—City, grading airport. **$40,000.** CAA will help finance.

N. C., Laurinburg—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Lincolnton—AIRPORT—City, grading, paving, lighting airport. **$210,000.** CAA will help finance.

N. C., Louisburg—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Manteo—AIRPORT—City, lighting, imprv. airport. **$30,000.** CAA will help finance.

N. C., Marion—AIRPORT—City, grading airport. **$110,000.** CAA will help finance.

N. C., Marshall—AIRPORT—City, grading airport. **$110,000.** CAA will help finance.

N. C., Mayodan-Madison—AIRPORT—Cities, grading, airport. **$140,000.** CAA will help finance.

N. C., Mocksville—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Monroe—AIRPORT—City, grading, paving, lighting airport. **$380,000.** CAA will help finance.

N. C., Mooresville—AIRPORT—City, grading, paving, lighting airport. **$380,000.** CAA will help finance.

N. C., Mount Airy—AIRPORT—City, grading, paving, lighting airport. **$380,000.** CAA will help finance.

N. C., Mount Olive — AIRPORT — City grading airport. **$140,000.** CAA will help finance.

N. C., Murfreesboro-Conway—AIRPORT—Cities, grading, airport. **$140,000.** CAA will help finance.

N. C., North Wilkesboro—AIRPORT—City, grading, paving, lighting airport. **$380,000.** CAA will help finance.

N. C., Nashville—AIRPORT—City, grading, airport. **$140,000.** CAA will help finance.

N. C., New Bern—AIRPORT—City, grading, paving airport. **$60,000.** CAA will help finance.

N. C., Newton-Conover—AIRPORT—Cities, grading airport. **$140,000.** CAA will help finance.

N. C., Plymouth—AIRPORT—City, grading, airport. **$140,000.** CAA will help finance.

N. C., Raeford—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Roanoke Rapids—AIRPORT—City, grading, paving, lighting airport. **$320,000.** CAA will help finance.

N. C., Rocky Mount—AIRPORT—City, grading, paving, lighting airport. **$150,000.** CAA will help finance.

N. C., Roxboro—AIRPORT—City, grading airport. **$160,000.** CAA will help finance.

N. C., Sanford—AIRPORT—City, grading, paving, lighting airport. **$310,000.** CAA will help finance.

N. C., Scotland Neck—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Shelby—AIRPORT—City, grading, lighting, paving airport. **$390,000.** CAA will help finance.

N. C., Silver City—AIRPORT—City, grading, airport. **$140,000.** CAA will help finance.

N. C., Smithfield-Selma — AIRPORT — Cities, grading airport. **$210,000.** CAA will help finance.

N. C., Southern Pines-Pinehurst—AIRPORT—Cities, grading, paving airport. **$220,000.** CAA will help finance.

N. C., Southport—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Spruce Pine—AIRPORT—City, grading, airport **$110,000.** CAA will help finance.

N. C., Statesville—AIRPORT—City, grading, paving, lighting airport. **$440,000.** CAA will help finance.

N. C., Tarboro—AIRPORT—City, grading, paving, lighting airport. **$390,000.** CAA will help finance.

N. C., Taylorsville—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Thomasville—AIRPORT—City, grading, paving, lighting airport. **$390,000.** CAA will help finance.

N. C., Troy—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Wadesboro—AIRPORT—City, grading airport. **$210,000.** CAA will help finance.

N. C., Wake Forest—AIRPORT—City, grading airport. **$260,000.** CAA will help finance.

N. C., Warrenton—AIRPORT—City, grading airport. **$60,000.** CAA will help finance.

N. C., Washington—AIRPORT—City, lighting, imprv. airport. **$40,000.** CAA will help finance.

N. C., Wendell-Zebulon—AIRPORT—Cities, grading airport. **$140,000.** CAA will help finance.

N. C., Whiteville—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Williamston—AIRPORT—City, grading airport. **$140,000.** CAA will help finance.

N. C., Wilmington—AIRPORT—City, lighting, imprv. airport. **$40,000.** CAA will help finance.

N. C., Winston Salem—AIRPORT—City, grading, paving, lighting airport. **$210,000.** CAA will help finance.

N. D., Ashley—AIRPORT—City, grading, paving, lighting airport. **$365,000.** CAA will help finance.

N. D., Beach—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

N. D., Bismarck—AIRPORT—City, paving airport. **$302,000.** CAA will help finance.

N. D., Bottineau—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

N. D., Carrington—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

N. D., Crosby—AIRPORT—City, grading airport. **$40,000.** CAA will help finance.

N. D., Devils Lake—AIRPORT—City, lighting, imprv. airport. **$32,000.** CAA will help finance.

N. D., Dickinson—AIRPORTS—City, lighting, imprv. 2 airports. **$32,000** each. CAA will help finance.

N. D., Ellendale—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

N. D., Fort Yates—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

N. D., Golva—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

N. D., Grafton—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

N. D., Harvey—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

N. D., Hillsboro—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

N. D., Jamestown — AIRPORT — City, lighting, imprv. airport. **$31,000.** CAA will help finance.

N. D., Kenmare—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

N. D., Lisbon—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

N. D., Mandan—AIRPORT—City, grading airport. **$250,000.** CAA will help finance.

N. D., Minot—AIRPORT—City, grading, lighting, imprv. airport. **$53,000.** CAA will help finance.

N. D., New Rockford—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

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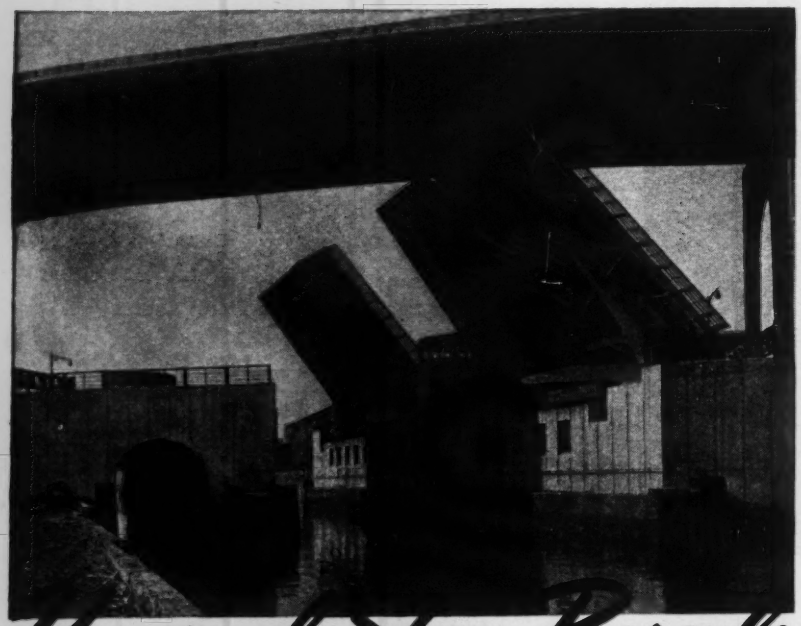

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POSTWAR PROJECTS (Cont'd.)

N. D., Ottos Ranch—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

N. D., Pembina—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

N. D., Portal—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

N. D., Rugby—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

N. D., Stanley—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

N. D., Wahpeton—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

N. D., Washburn—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

N. D., Watford City—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Alliance—AIRPORT—City, grading, paving, lighting airport. $304,000; grading, lighting airport. $40,000. CAA will help finance.

O., Amsterdam—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Archbold—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

O., Ashland—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Athens—AIRPORT—City, grading, paving, lighting airport. $365,000. CAA will help finance.

O., Avon Lake—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Barberton—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Barnesville—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Bellaire—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Bellefontaine—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Bellevue—AIRPORT—City, grading, lighthing airport. $64,000. CAA will help finance.

O., Belpre—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Berea—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Bethel—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Blanchester—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Bowling Green — AIRPORT — City, grading, lighting airport. $54,000. CAA will help finance.

O., Bridgeport—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Brookville—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Bryan — AIRPORT — City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Bucyrus—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Cadiz—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Cambridge—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Campbell—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Canton—AIRPORTS—City, grading, lighting airport. $64,000; grading, lighting airport, $40,000. CAA will help finance.

O., Carey—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Chagrin Falls—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Cherry Fork—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

O., Chesapeake—AIRPORT—City, grading, lighting airport. $25,000. CAA will help finance.

O., Circleville—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

O., Cleveland Heights—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

O., Columbus—AIRPORTS—City, grading airport $25,000; grading, lighting, paving airport, $304,000; grading airport, $25,000. CAA will help finance.

O., Connneaut—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Covington—AIRPORT—City, grading airport. $25,000. CAA will help finance.

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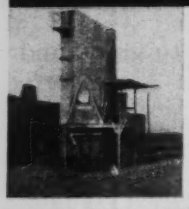

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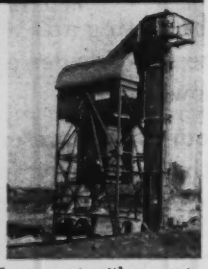

For contractors who need greater storage capacity than is provided by Elevating Charger or Dutch Mill. Completely portable. Capacity may be increased in the field. Equipped for unloading and batching cement delivered in any type of transportation facilities. 240 bbl., 375 bbl. and 500 bbl. capacities. Elevator Equipment with capacities up to 300 bbls. per hour.

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POSTWAR PROJECTS (Cont'd.)

O., Crooksville—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Cuyahoga Falls — AIRPORT — City, grading airport. $25,000. CAA will help finance.

O., Delphos—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Delta—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., East Cleveland—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., East Liverpool—AIRPORT—City, grading, paving, lighting airport. $104,000. CAA will help finance.

O., East Palestine—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Eaton—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Euclid—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Fairfield—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Findlay—AIRPORT—City, grading, paving, lighting airport. $365,000. CAA will help finance.

O., Fostoria—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Fremont—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Galion — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance.

O., Geneva—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Genoa—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Georgetown—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Gibbonsburg—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Glouster—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Greenfield—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Greenville—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

O., Hicksville—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Hillsboro—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Hudson—AIRPORT—City, grading airport. $40,000. CAA will help finance.

O., Ironton—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Jackson—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Jefferson—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Kent—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Kenton — AIRPORT — City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Lancaster—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Lebanon—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Lexington—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Lodi—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Logan—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., London—AIRPORT—City, grading, lighting airport. $40,000. CAA will help finance.

O., McConnellsville — AIRPORT — City, grading airport. $25,000. CAA will help finance.

O., Manchester—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Mansfield—AIRPORT—City, grading airport. $25,000. CAA will help finance. CD 12/21/43—ENR 1/13/44.

O., Marietta—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Marysville—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Massilion—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Medina—AIRPORT—City, grading airport. $64,000. CAA will help finance.

O., Miamisburg—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Middlefield—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Middleport—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

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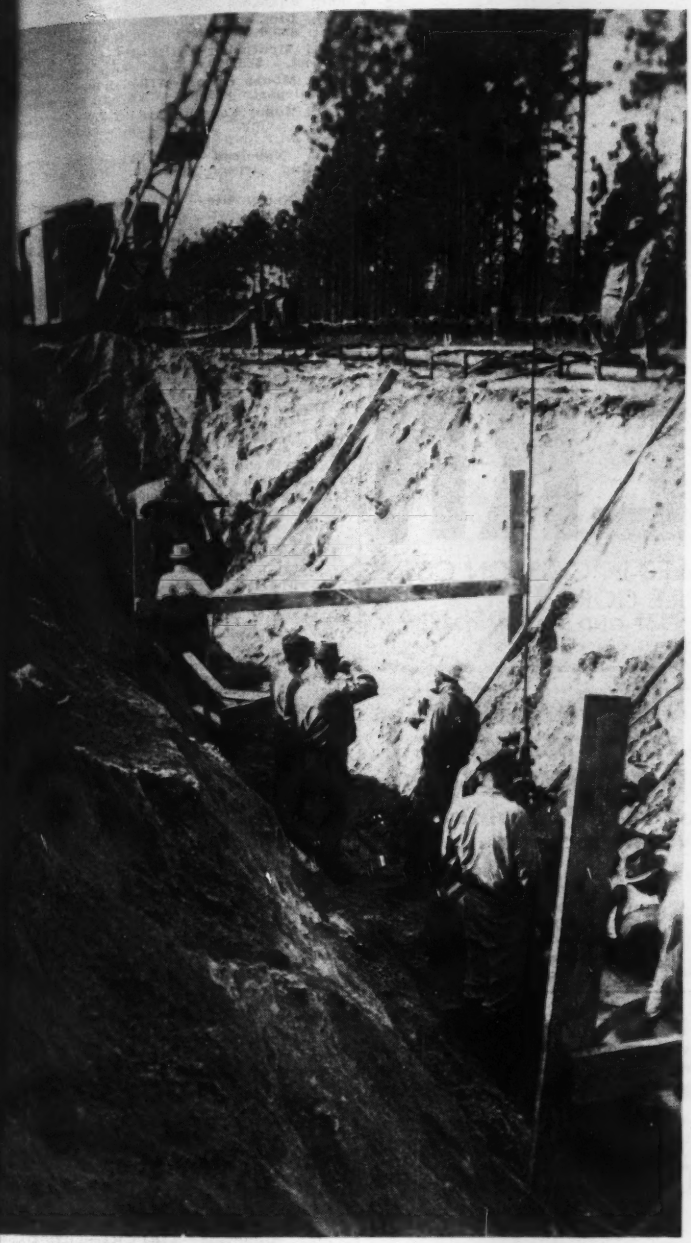

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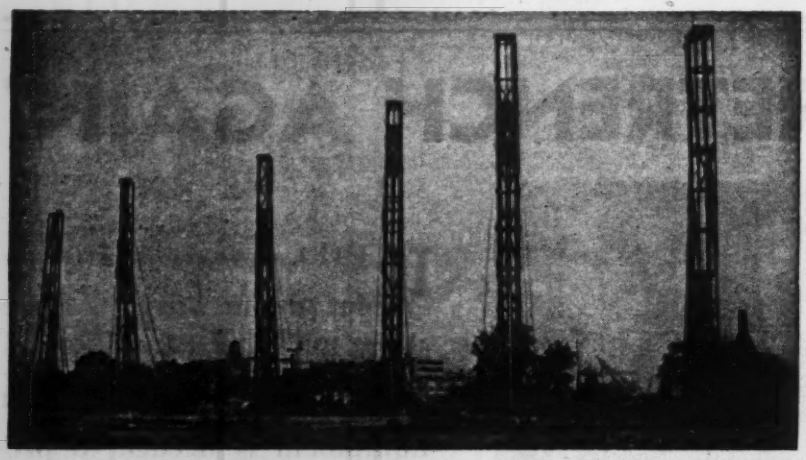

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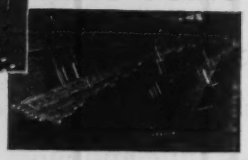

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FLEXCO H D BELT FASTENERS make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.

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POSTWAR PROJECTS (Cont'd.)

O., Middletown—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance. CD 3/16—ENR 4/5.

O., Millersburg—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Minerva—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Mingo Junction — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance.

O., Minster—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Montpelier—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Mount Gilead—AIRPORT—City, grading, airport. $25,000. CAA will help finance.

O., Mount Vernon—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Napoleon—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Nelsonville—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Newark — AIRPORT — City, grading, paving airport. $365,000. CAA will help finance.

O., Newcomerstown — AIRPORT — City, grading, lighting airport. $10,000. CAA will help finance.

O., New London—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., New Richmond — AIRPORT — City, grading airport. $25,000. CAA will help finance.

O., Newton Falls—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Niles-Girard—AIRPORT—Cities, grading, paving, lighting airport. $304,000. CAA will help finance.

O., North Baltimore — AIRPORT — City, grading airport. $25,000. CAA will help finance.

O., Norwalk—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Oak Harbor—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Oak Hill—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Oberlin — AIRPORT — City, grading, lighting airport. $40,000. CAA will help finance.

O., Orrville — AIRPORT — City, grading airport. $25,000. CAA will help finance.

O., Ottawa—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Oxford — AIRPORT — City, grading, lighting airport. $64,000. CAA will help finance.

O., Painesville—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Paulding — AIRPORT — City, grading, lighting airport. $40,000. CAA will help finance.

O., Piney Fork—AIRPORT—City, grading airport. $26,000. CAA will help finance.

O., Piqua—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Poland—AIRPORT—City, grading airport, $25,000. CAA will help finance.

O., Port Clinton—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Powhatan Point—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Richwood—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Rittman—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., St. Clairsville—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., St. Marys—AIRPORT—City, grading, paving airport. $304,000. CAA will help finance.

O., Salem—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Salineville—AIRPORT—City, grading airport. $25,000. CAA will help finance.

O., Sharonville—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Shawnee—AIRPORT—City, grading airport. $25,000. CAA will help finance.

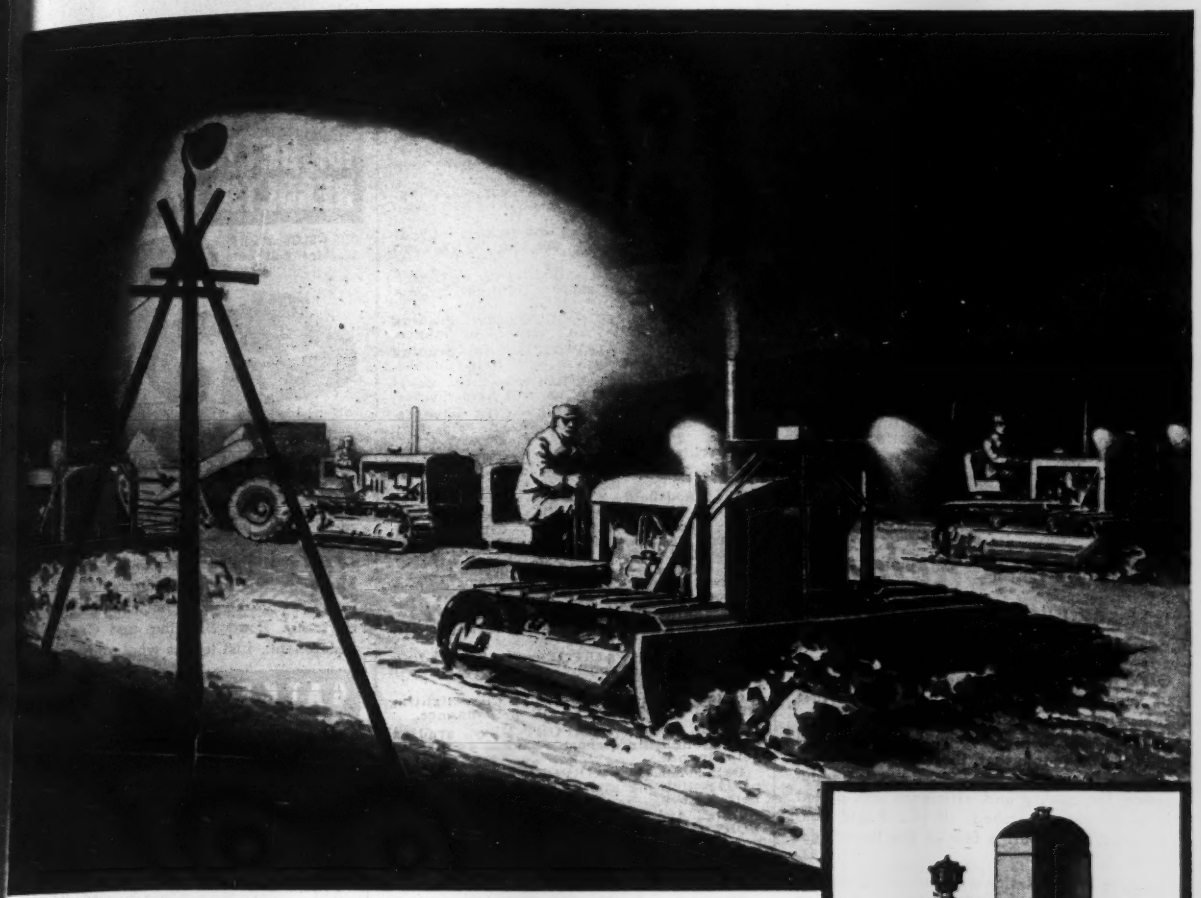
O., Shelby—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

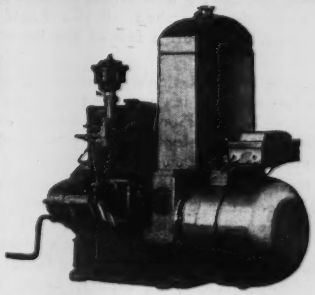
O., Sidney—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.

O., Springfield—AIRPORTS—City, lighting airport, $50,000; grading airport $25,000; grading airport $25,000. CAA will help finance.

O., Tiffin—AIRPORT—City, grading, paving, lighting airport. $304,000. CAA will help finance.

O., Toronto—AIRPORT—City, grading, lighting airport. $64,000. CAA will help finance.





Kohler Model E Electric Plant. 1500 watts, 115 volt DC—Hand cranked. For heavy-duty, economical, continuous service.

Seabees save an Airport

and KOHLER Electric Plants win a citation for service in night-lighting the job

WE quote, in part, from a telegram received August 2, 1944 from Vice Admiral Ben Moreell (CEC) USN, Chief of the Bureau of Yards and Docks:

"The excellent service rendered by one of your 2KW electric plants in providing night illumination for an emergency repair job at an important airport in the Aleutians is cited in a report from a Navy Construction Battalion. The settling of a large section of air strip threatened to halt all air operations at the field unless speedy repairs were effected. Your electric plant enabled the Seabees to work nights as well as days . . . without loss of time."

This fine tribute to the rugged reliability of Kohler Electric Plants will be no surprise to many contractors and engineers throughout the country. They know from long experience how well these compact units serve on excavators, dredges, draglines and portable equipment in the building of roads, dams, bridges, and countless other projects. Kohler plants not only floodlight night working areas but also drive motors, pumps, air compressors, lathes, drills and portable electric saws. Their uniform efficiency is the result of years of manufacturing experience.

Model E, most commonly used in construction work, is now available to essential users. Write for full information. Kohler Co., Dept. EN-2, Kohler, Wisconsin. Established 1873.

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Great Industries, following in the footsteps of hundreds of towns and cities, give first choice to Layne installed Wells and Layne built Vertical Turbine Pumps. Industrial engineers have found that there is no "just as good." They have found that Layne's reputation for quality and efficiency equipment is absolutely unmatched. If you should wonder why, check just a few of the major reasons:

Layne is the Nation's oldest and most successful pioneer in designing and building Vertical Turbine Pumps. They developed and hold exclusive patents on many tremendously important efficiency features.

Next, Layne perfected a type of Well installation that produces more water, saves costly horsepower and invariably lasts longer.

Every Layne Pump is precision-built in Layne's own Engineer supervised factory. All materials: iron, steel, bronze, brass, nickel, etc., are of a uniformly extra high quality.

To avoid excessive repair expense, high operation cost, shorter life and possible failure at a critical time, place your confidence in, and demand, Layne Wells and Vertical Turbine Pumps. For late literature, address, Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

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LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

POSTWAR PROJECTS (Cont'd.)

O., Troy—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

O., Upper Sandusky—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

O., Urbana — AIRPORT — City, grading, lighting airport. **$64,000.** CAA will help finance.

O., Vans Wert—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

O., Wadsworth—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

O., Wapakoneta—AIRPORT—City, grading, lighting airport. **$64,000.** CAA will help finance.

O., Warren — AIRPORT — City, grading, paving, lighting airport. **$304,000.** CAA will help finance.

O., Wauseon — AIRPORT — City, grading airport. **$25,000.** CAA will help finance.

O., Waverly — AIRPORT — City, grading airport. **$25,000.** CAA will help finance.

O., West Milton—AIRPORT—City, grading airport. **$25,000.** CAA will help finance.

O., Willard — AIRPORT — City, grading, lighting airport. **$40,000.** CAA will help finance.

O., Willoughby—AIRPORT—City, grading, lighting airport. **$40,000.** CAA will help finance.

O., Woodsfield—AIRPORT—City, grading airport. **$25,000.** CAA will help finance.

O., Wooster — AIRPORT — City, grading, paving, lighting airport. **$304,000.** CAA will help finance.

O., Xenia — AIRPORT — City, grading, lighting airport. **$64,000.** CAA will help finance.

O., Zanesville—AIRPORTS—City, grading, paving airport, **$255,000**; grading airport, **$25,000.**

Okla., Allen — AIRPORT — City, grading, paving, lighting airport. **$73,680.** CAA will help finance.

Okla., Altus — AIRPORT — City, lighting airport. **$51,970.** CAA will help finance.

Okla., Antlers—AIRPORT—City, grading, paving, lighting airport. **$64,388.** CAA will help finance.

Okla., Apache—AIRPORT—City, grading, paving, lighting airport. **$78,300.** CAA will help finance.

Okla., Ardmore—Lake (mail Tulsa)—AIRPORT—Cities, grading, paving, lighting airport. **$353,262.** CAA will help finance.

Okla., Atoka—AIRPORT—City, grading, paving, lighting airport. **$111,700.** CAA will help finance.

Okla., Beaver—Forgan—AIRPORT—Cities, grading, paving, lighting airport. **$99,319.** CAA will help finance.

Okla., Blanchard—AIRPORT—City, grading, paving, lighting airport. **$112,255.** CAA will help finance.

Okla., Boise City—AIRPORT—City, grading, paving, lighting airport. **$164,340.** CAA will help finance.

Okla., Bristow—AIRPORT—City, grading, paving, lighting airport. **$395,505.** CAA will help finance.

Okla., Broken Bow — AIRPORT — City, grading, paving, lighting airport. **$274,940.** CAA will help finance.

Okla., Buffalo—AIRPORT—City, grading, paving, lighting airport. **$62,183.** CAA will help finance.

Okla., Cache—AIRPORT—City, grading, paving, lighting airport. **$405,340.** CAA will help finance.

Okla., Carnegie—AIRPORT—City, grading, paving, lighting airport. **$76,210.** CAA will help finance.

Okla., Chandler—AIRPORT—City, grading, paving, lighting airport. **$99,440.** CAA will help finance.

Okla., Checotah—AIRPORT—City, grading, paving, lighting airport. **$103,180.** CAA will help finance.

Okla., Chelsea—AIRPORT—City, grading, paving, lighting airport. **$51,865.** CAA will help finance.

Okla., Cherokee — AIRPORT — City, grading, paving, lighting airport. **$62,733.** CAA will help finance.

Okla., Cheyenne—AIRPORT—City, grading, paving airport. **$140,965.** CAA will help finance.

Okla., Claremore—AIRPORT—City, grading, paving, lighting airport. **$362,571.** CAA will help finance.

Okla., Cleveland-Hominy — AIRPORT — Cities, grading, lighting airport. **$129,086.** CAA will help finance.

Okla., Coalgate—AIRPORT—City, grading, paving, lighting airport. **$53,383.** CAA will help finance.

Okla., Collinsville—AIRPORT—City, grading, paving, lighting airport. **$64,550.** CAA will help finance.

Okla., Cordell—AIRPORT—City, grading, paving, lighting airport. **$108,515.** CAA will help finance.

Okla., Drumright—AIRPORT—City, grading, paving, lighting airport. **$98,395.** CAA will help finance.

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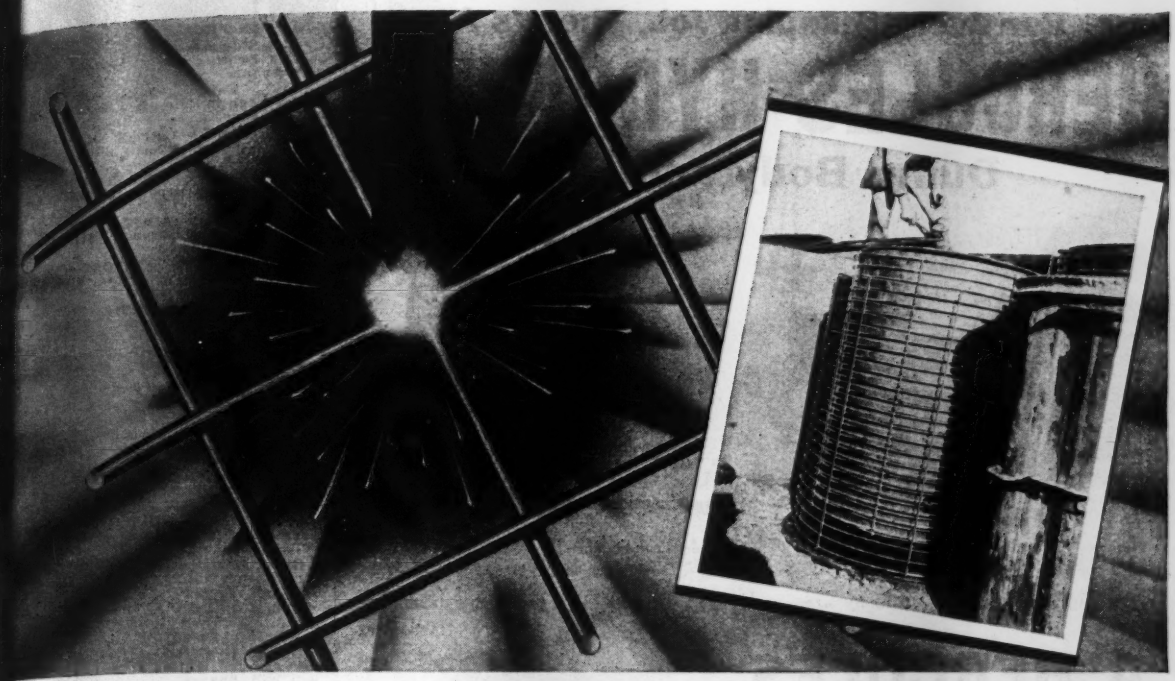

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On tough circular reinforcement jobs, like sewers and storage tanks, the use of Clinton Reinforcing Fabric will ease your mind about the difficulties sometimes involved in this type of construction.

Clinton Fabric is characterized by its high *uniform* tensile strength. Electric welding fuses the wires, imparting a shearing strength to welds that generally exceeds the tensile strength of the wire itself. And there are no clips or ties to come undone, or to interfere with the smooth flow of concrete around intersections.

Since Clinton Reinforcing Fabric comes in sheets or rolls, cut to your *exact* specifications, it saves handling time on location. Try Clinton Fabric on your next reinforced concrete job and you'll know why it is the choice of so many leading contractors and engineers.

CLINTON WELDED FABRIC PROVIDES THESE ADVANTAGES

QUALITY
Automatic machines accurately fix members at right angles to coincide with lines of stress in concrete. There are no clips or ties to break or come undone.

PERFORMANCE
Years of experience show that when concrete construction jobs are reinforced with Clinton Fabric maintenance costs are remarkably low.

STRENGTH
Ultimate tensile strength of not less than 70,000 lbs. per sq. inch in accordance with A.S. T.M. Serial Designations A 82-34 and A 185-37.

CONVENIENCE
Available in a wide range of styles both in gauge and spacing. Delivered cut to size for easy storage, handling and use.

ECONOMY
Speeds handling, reduces hazards, saves time and expense—even on tough, circular reinforcement jobs.

UTILITY
Clinton Welded Fabric has been used successfully and economically in every form of reinforced concrete construction.

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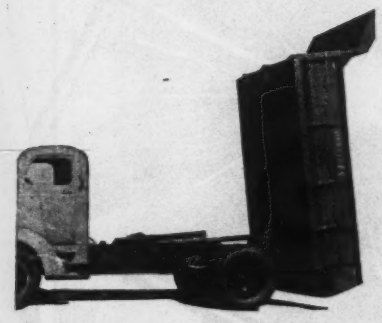
Hercules Removable Side Rub Rail Body With Hinged Rear Corner Post.



Hercules High Dumper-Power Up, Power Down, with 78° dumping angle. Hoist capacity 12 tons.

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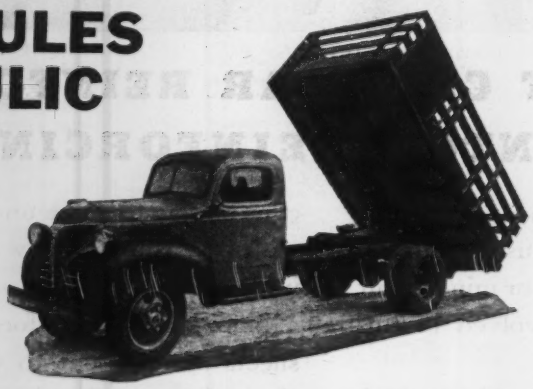
Makes any Truck A **DUMP TRUCK**



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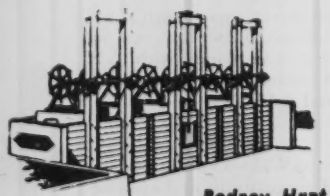
Manufacturers of Hercules Hydraulic Hoists, Dump Bodies, Split-Shaft Power Take-Offs and "Power-Chute" Hydraulic Coal Unloaders



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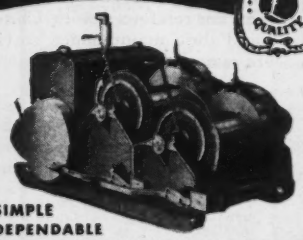

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POSTWAR PROJECTS (Cont'd.)

Okla., Edmond—AIRPORT—City, grading, paving, lighting airport. $61,633. CAA will help finance.

Okla., Enid—AIRPORT—City, grading, paving, lighting airport. $86,020. CAA will help finance.

Okla., Erick—AIRPORT—City, grading, paving, lighting airport. $81,895. CAA will help finance.

Okla., Eufaula—AIRPORT—City, grading, paving, lighting airport. $57,002. CAA will help finance.

Okla., Fairfax—AIRPORT—City, grading, paving, lighting airport. $115,445. CAA will help finance.

Okla., Fairview—AIRPORT—City, grading, paving, lighting airport. $104,885. CAA will help finance.

Okla., Gage—AIRPORT—City, grading, paving, lighting airport. $176,820. CAA will help finance.

Okla., Garber—AIRPORT—City, grading, paving, lighting airport. $82,600. CAA will help finance.

Okla., Geary—AIRPORT—City, grading, paving, lighting airport. $66,750. CAA will help finance.

Okla., Goodwell—AIRPORT—City, grading, paving, lighting airport. $273,669. CAA will help finance.

Okla., Grandfield—AIRPORT—City, grading, paving, lighting airport. $85,074. CAA will help finance.

Okla., Grove—AIRPORT—City, grading, paving, lighting airport. $250,041. CAA will help finance.

Okla., Hartshorne—AIRPORT—City, grading, paving, lighting airport. $80,289. CAA will help finance.

Okla., Haskell—AIRPORT—City, grading, paving, lighting airport. $103,279. CAA will help finance.

Okla., Healdton—AIRPORT—City, grading, paving, lighting airport. $119,911. CAA will help finance.

Okla., Heavener—AIRPORT—City, grading, paving, lighting airport. $76,307. CAA will help finance.

Okla., Hennessey—AIRPORT—City, grading, paving, lighting airport. $77,130. CAA will help finance.

Okla., Henryetta—AIRPORT—City, grading, paving, lighting airport. $257,534. CAA will help finance.

Okla., Hobart—AIRPORT—City, grading, paving, lighting airport. $125,010. CAA will help finance.

Okla., Holdenville—AIRPORT—City, grading, paving, lighting airport. $318,090. CAA will help finance.

Okla., Hollis—AIRPORT—City, grading, paving, lighting airport. $88,055. CAA will help finance.

Okla., Hooker—AIRPORT—City, grading, paving, lighting airport. $108,999. CAA will help finance.

Okla., Ketchum—AIRPORT—City, grading, paving, lighting airport. $259,325. CAA will help finance.

Okla., Kingfisher—AIRPORT—City, grading, paving, lighting airport. $327,729. CAA will help finance.

Okla., Langston—AIRPORT—City, grading, paving, lighting airport. $79,783. CAA will help finance.

Okla., Lindsay—AIRPORT—City, grading, paving, lighting airport. $74,260. CAA will help finance.

Okla., Madill—AIRPORT—City, grading, paving, lighting airport. $169,800. CAA will help finance.

Okla., Marietta—AIRPORT—City, grading, paving, lighting airport. $130,930. CAA will help finance.

Okla., Marlow—AIRPORT—City, grading, paving, lighting airport. $143,550. CAA will help finance.

Okla., Maud — AIRPORT — City, grading, paving, lighting airport. $76,430. CAA will help finance.

Okla., Medford—AIRPORT—City, grading, paving, lighting airport. $69,500. CAA will help finance.

Okla., Moseley—AIRPORT—City, grading, paving, lighting airport. $360,630. CAA will help finance.

Okla., Nowata—AIRPORT—City, grading, lighting paving airport. $75,670. CAA will help finance.

Okla., Okemah—AIRPORT—City, grading, paving, airport. $253,770. CAA will help finance.

Okla., Okmulgee—AIRPORT—City, grading, paving, lighting airport. $216,348. CAA will help finance.

Okla., Pauls Valley—AIRPORT—City, grading, paving, lighting airport. $404,280. CAA will help finance.

Okla., Pawnee—AIRPORT—City, grading, paving, lighting airport. $75,383. CAA will help finance.

Okla., Perry—AIRPORT—City, grading, paving, lighting airport. $288,450. CAA will help finance.

Okla., Picher—AIRPORT—City, grading, paving, lighting airport. $49,005. CAA will help finance.

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One of the most useful types of war vehicles now in service with the Armed Forces, particularly in the Pacific, is the amphibious tractor known as "Water Buffalo," or LVT (Landing Vehicle, Tracked).

As the designers (in cooperation with the Bureau of Ships, U. S. Navy), engineers and manufacturers of "Water Buffalos," we of Food Machinery Corporation believe there will be a postwar market for amphibious tractors redesigned and built for *commercial* use. The purpose of this and similar advertising is to find out if we are right.

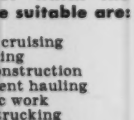
These versatile machines travel as readily on water as on land. Their amazing mechanical stability enables them to be driven through heavy seas, across reefs, onto beaches and over the roughest terrain. Hauling cargos of men, supplies and equipment, they easily negotiate swamps, jungles, rivers and rugged country impenetrable by any other vehicle. They possess extraordinary maneuverability, power and traction... turn on a dime, knock over trees, climb like mountain goats!

Now our entire output of amphibians is going to the Army, Navy and Marines. But we have published a folder containing descriptions and specifications for a commercial amphibian. We will be glad to send this folder to interested business executives who feel that their firm might have use for a postwar "Water Buffalo."

Some of the operations for which the peacetime amphibian may be suitable are:

Mine prospecting	Timber cruising
Mining	Lumbering
Surveying	Road construction
Rescue work in flood, ice and marshland	Equipment hauling
	Geologic work
Flood control work	Jungle trucking
Maintenance of oil, water, power and telephone lines	Mosquito control
	Coast transportation, particularly where no dock facilities are available
Non-navigable river transportation	

Probably, after reading our folder, other uses will occur to you, possibly in your own field. Write for the folder to "Water Buffalo," Food Machinery Corporation, Riverside, California.



FOOD MACHINERY CORPORATION

RIVERSIDE DIVISION, RIVERSIDE, CALIFORNIA

POSTWAR PROJECTS (Cont'd.)

Okla., Poteau—AIRPORT—City, grading, paving, lighting airport. $497,189. CAA will help finance.

Okla., Prague—AIRPORT—City, grading, paving, lighting airport. $129,019. CAA will help finance.

Okla., Pryor—AIRPORT—City, grading, paving, lighting airport. $247,291. CAA will help finance.

Okla., Purcell-Lexington — AIRPORT — Cities, grading, paving, lighting airport. $85,070. CAA will help finance.

Okla., Quinton—AIRPORT—City, grading, paving, lighting airport. $56,980. CAA will help finance.

Okla., Roosevelt—AIRPORT—City, grading, paving, lighting airport. $83,225. CAA will help finance.

Okla., Sallisow—AIRPORT—City, grading, paving, lighting airport. $225,291. CAA will help finance.

Okla., Sapulpa—AIRPORT—City, grading, paving, lighting airport. $121,750. CAA will help finance.

Okla., Sayre—AIRPORT—City, grading, paving, lighting airport. $351,460. CAA will help finance.

Okla., Shawnee—AIRPORT—City, grading, paving, lighting airport. $121,250. CAA will help finance.

Okla., Snyder—AIRPORT—City, grading, paving, lighting airport. $80,355. CAA will help finance.

Okla., Spiro—AIRPORT—City, grading, paving, lighting airport. $65,505. CAA will help finance.

Okla., Stigler—AIRPORT—City, grading, paving, lighting airport. $64,020. CAA will help finance.

Okla., Stillwater—AIRPORT—City, grading, paving, lighting airport. $173,960. CAA will help finance.

Okla., Sulphur—AIRPORT—City, grading, paving, lighting airport. $314,989. CAA will help finance. CD 10/13—ENR 11/2.

Okla., Tahlequah—AIRPORT—City, grading, paving airport. $95,040. CAA will help finance.

Okla., Talhina—AIRPORT—City, grading, paving, lighting airport. $139,639. CAA will help finance.

Okla., Tecumseh—AIRPORT—City, grading, paving, lighting airport. $71,480. CAA will help finance.

Okla., Tishomingo—AIRPORT—City, grading, paving, lighting airport. $248,171. CAA will help finance.

Okla., Tonkawa—AIRPORT—City, grading, paving airport. $80,300. CAA will help finance.

Okla., Wagoner—AIRPORT—City, grading, paving, lighting airport. $46,310. CAA will help finance.

Okla., Walters—AIRPORT—City, grading, paving, lighting airport. $74,910. CAA will help finance.

Okla., Watonga—AIRPORT—City, grading, paving, lighting airport. $71,150. CAA will help finance.

Okla., Waurika—AIRPORT—City, grading, paving, lighting airport. $95,970. CAA will help finance.

Okla., Weatherford — AIRPORT — City, grading, paving, lighting airport. $380,270. CAA will help finance.

Okla., Weleetka—AIRPORT—City, grading, paving, lighting airport. $188,353. CAA will help finance.

Okla., Wetumka—AIRPORT—City, grading, paving, lighting airport. $49,250. CAA will help finance.

Okla., Wewoka—AIRPORT—City, grading, paving, lighting airport. $332,310. CAA will help finance.

Okla., Wilburton—AIRPORT—City, grading, paving airport. $50,589. CAA will help finance.

Okla., Wilson—AIRPORT—City, grading, paving, lighting airport. $111,280. CAA will help finance.

Okla., Woodward—AIRPORT—City, grading, paving, lighting airport. $51,854. CAA will help finance.

Ore., Albany—AIRPORT—City, grading, lighting airport. $144,000. CAA will help finance.

Ore., Arlington—AIRPORT—City, grading airport. $25,000. CAA will help finance.

Ore., Astoria—AIRPORT—City, grading, paving airport. $304,000. CAA will help finance.

Ore., Baker — AIRPORT — City, grading, paving, lighting airport. $128,000. CAA will help finance.

Ore., Bandon—AIRPORT—City, grading airport. $57,000. CAA will help finance.

Ore., Bend — AIRPORT — City, grading, paving, lighting airport. $485,000. CAA will help finance.

Ore., Brookings—AIRPORT—City, grading airport. $99,000. CAA will help finance.

Ore., Camas Valley — AIRPORT — City, grading airport. $90,000. CAA will help finance.

Ore., Chiloquin—AIRPORT—City, grading airport. $113,000. CAA will help finance.

Ore., Condon—AIRPORT—City, grading airport. $77,000. CAA will help finance.

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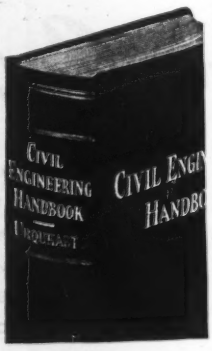

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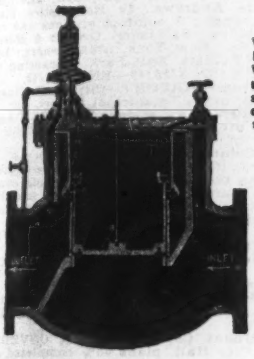

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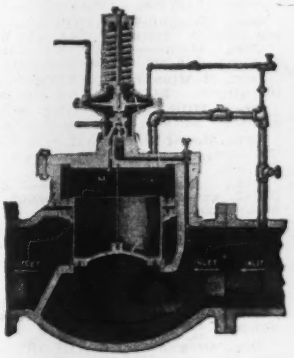

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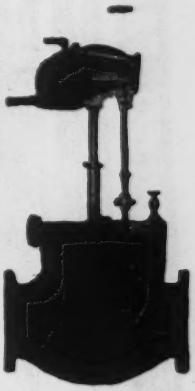

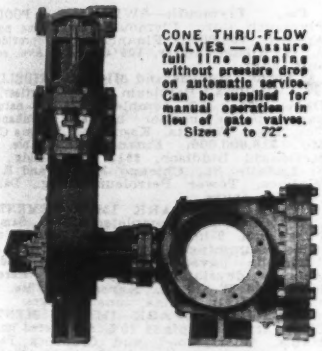

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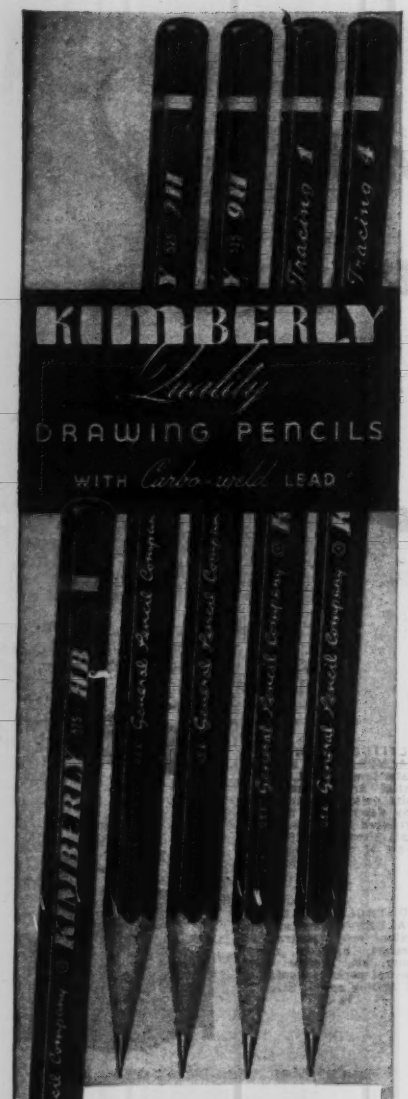
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Ore., Cottage Grove — AIRPORT — City, grading airport. **$79,000.** CAA will help finance.

Ore., Crater Lake—AIRPORT—City, grading airport. **$97,000.** CAA will help finance.

Ore., Dallas-Monmouth—AIRPORT—Cities, grading airport. **$89,000.** CAA will help finance.

Ore., Drewsey—AIRPORT—City, grading airport. **$51,000.** CAA will help finance.

Ore., Enterprise—AIRPORT—City, grading, lighting airport. **$207,000.** CAA will help finance.

Ore., Eugene—AIRPORT—City, grading, paving airport. **$120,000.** CAA will help finance.

Ore., Florence—AIRPORT—City, grading airport. **$104,000.** CAA will help finance.

Ore., Gold Beach—AIRPORT—City, grading, paving, lighting airport. **$223,000.** CAA will help finance.

Ore., Grants Pass—AIRPORT—City, grading, lighting airport. **$126,000.** CAA will help finance.

Ore., Hampton—AIRPORT—City, grading airport. **$38,000.** CAA will help finance.

Ore., Harper—AIRPORT—City, grading airport. **$41,000.** CAA will help finance.

Ore., Heppner—AIRPORT—City, grading airport. **$157,000.** CAA will help finance.

Ore., Hood River—AIRPORT—City, grading, lighting airport. **$240,000.** CAA will help finance.

Ore., Illahe—AIRPORT—City, grading, paving, lighting airport. **$245,000.** CAA will help finance.

Ore., Jordan Valley—AIRPORT—City, grading airport. **$50,000.** CAA will help finance.

Ore., Lake of the Woods—AIRPORT—City, grading airport. **$117,000.** CAA will help finance.

Ore., Lapine—AIRPORT—City, grading airport. **$88,000.** CAA will help finance.

Ore., Lebanon—AIRPORT—City, grading airport. **$102,000.** CAA will help finance.

Ore., Marshfield—AIRPORT—City, grading airport. **$59,000.** CAA will help finance.

Ore., Maupin—AIRPORT—City, grading airport. **$48,000.** CAA will help finance.

Ore., McMinnville—AIRPORT—City, lighting airport. **$33,000.** CAA will help finance.

Ore., Millican—AIRPORT—City, grading airport. **$50,000.** CAA will help finance.

Ore., Mount Hood—AIRPORT—City, grading airport. **$249,000.** CAA will help finance.

Ore., Nelscott-Oceanlake — AIRPORT — Cities, grading airport. **$96,000.** CAA will help finance.

Ore., Newberg—AIRPORT—City, grading airport. **$141,000.** CAA will help finance.

Ore., North Bend—AIRPORT—City, grading, paving airport. **$294,000.** CAA will help finance.

Ore., Ontario — AIRPORT — City, grading, paving airport. **$62,000.** CAA will help finance.

Ore., Oregon City—AIRPORT—City, grading airport. **$113,000.** CAA will help finance.

Ore., Paisley — AIRPORT — City, grading airport. **$60,000.** CAA will help finance.

Ore., Prairie City—AIRPORT—City, grading, lighting airport. **$150,000.** CAA will help finance.

Ore., Redmond—AIRPORT—City, lighting airport. **$40,000.** CAA will help finance.

Ore., Roseburg—AIRPORT—City, grading, paving, lighting airport. **$113,000.** CAA will help finance.

Ore., Santiam Pass — AIRPORT — City, grading airport. **$50,000.** CAA will help finance.

Ore., Scappoose—AIRPORT—City, grading, paving, lighting airport. **$185,000.** CAA will help finance.

Ore., Seaside — AIRPORT — City, grading, paving, lighting airport. **$349,000.** CAA will help finance.

Ore., Silver Lake—AIRPORT—City, grading airport. **$60,000.** CAA will help finance.

Ore., Silverton—AIRPORT—City, grading airport. **$65,000.** CAA will help finance.

Ore., Suntex — AIRPORT — City, grading airport. **$65,000.** CAA will help finance.

Ore., Sweet Home—AIRPORT—City, grading airport. **$100,000.** CAA will help finance.

Ore., Tillamook—AIRPORT—City, grading airport. **$84,000.** CAA will help finance.

Ore., Vernonia—AIRPORT—City, grading, lighting airport. **$148,000.** CAA will help finance.

R. I., North Providence—ATHLETIC FIELDS—Town, Bd. Selectmen, Town Hall, 8 athletic fields, various parts of town. **$75,000.** Financing not provided.

N. S., Middleton—AIRPORT—Municipality, imprv. Greenwood Airport. **$100,000.**

★**Ont., Toronto** — LIGHTING SYSTEM — Municipality plans lighting sys. **$500,000.**

Que., Limoilou—ROLLER SKATING RINK etc.—W. T. Byrne, First Ave., plans roller skating rink and restaurant. **$40,000.**

PLANS UNDER WAY

Conn., New London—WHARF—City, City Mgr., City Hall, wharf, dock facilities. Over **$25,000.** Financing not provided. K. E. Holmes, City Hall, city engr.

Ga., Decatur—PARK IMPROVEMENTS—DeKalb Co., Decatur, park imprvs. **$100,000** bonds voted. E. W. Weir, Court House, engr.

Ia., Clinton—PARK IMPROVEMENTS—A. J. Lerche, clk., City Hall, **$200,000** bonds issued, renovating Riverview Park. B. E. Anderson, city engr. CD 11/30—ENR 12/16.

Me., South Portland—PARK—City, c/o City Manager, City Hall, preliminary plans under way municipal park on Cottage St. Over **$50,000.** Site purchased. Financing not provided.

★**Mass., East Boston**—AIRPORT—Commonwealth of Massachusetts, Dpt. Public Wks., 100 Nashua St., Boston, airport terminal construction, Logan Airport, PE-2, **$7,150,000.** Financing not provided. CAA will help finance. Thompson & Lightner Co., Inc., 620 Newbury St., Boston, consult. engrs.

Mont., Helena — MEMORIAL — City, City Hall, plans 75% completed memorial, athletic field and general park. **$250,000.** Land rights not cleared, financing not provided.

N. Y., Brooklyn — GOLF HOUSE — Dpt. Parks, Arsenal Bldg., Central Park, 5 Ave. and 64 St., New York, plans completed by Skidmore, Owings & Merrill, 5 E. 57 St., New York, golf house in Marine Park, P-77, **$120,000.** Financing not provided. CD 12/26/43—ENR 4/1/43.

N. Y., New York—COMFORT STATIONS, etc.—Dpt. Parks, Arsenal Bldg., 5 Ave. and 64 St., New York, plans completed by Skidmore, Owings & Merrill, 5 E. 57 St., 3 comfort stations, concession and comfort station and field house, Van Courtlandt Park, P 88, **$111,000.** Financing not provided. CD 3/26/43—ENR 4/1/43.

★**N. Y., New York**—PARK IMPROVEMENTS, etc.—Dpt. Parks, Arsenal Bldg., 5 Ave. and 64 St., Central Park, plans completed development various unimproved areas and construction electrical services, drainage, irrigation, park lighting, tide gates and dams and water supply sys., **$1,072,330.** W. Earle Andrews, 30 Rockefeller Plaza, Zone 30, engr.; 3 comfort stations and concession bldgs., Skidmore, Owings & Merrill, 5 E. 57 St., New York, archts.-engrs.; both P-91, in Pelham Bay Park. Financing not provided. CD 3/26/43—ENR 4/1/43.

O., Akron—AIRPORT—City, C. E. Slusser, City Hall, expan. municipal airport, incl. installing addnl. taxi-strips. **$100,000.** Financing not provided. L. B. Hiebel, Municipal Bldg., city engr.

★**O., Columbus**—SWIMMING POOLS, etc. —City, City Hall, plans 5% completed swimming pools, shelterhouses, tennis courts, baseball diamonds, etc. **$1,000,000;** installing street signs, **$50,000.** Legal obstacles to be overcome, financing not provided. P. W. Maetzel, City Hall, city engr. CD 8/11—ENR 8/24.

O., Newark—STREET LIGHTING CIRCUITS, etc.—City, Dpt. Pub. Serv., Div. Engineering, rearranging street lighting circuits, **$40,000;** complete improved street lighting, **$150,000.** C. H. Wells, City Hall, city engr.

Pa., Mount Carmel—CREEK COVERING—Boro, City Hall, plans 50% completed continuous rein.-con. slab covering over channel of Shomokin Creek, **$400,000.** Financing not provided. H. W. Jones, 326 S. Oak St., engr.

Pa., Plymouth—SWIMMING POOL—Plymouth Boro, Plymouth, swimming pool. Approx. **$60,000.** Financing not provided. A. G. Kostenbauder, 106 Gaylord Ave., consult. engr.

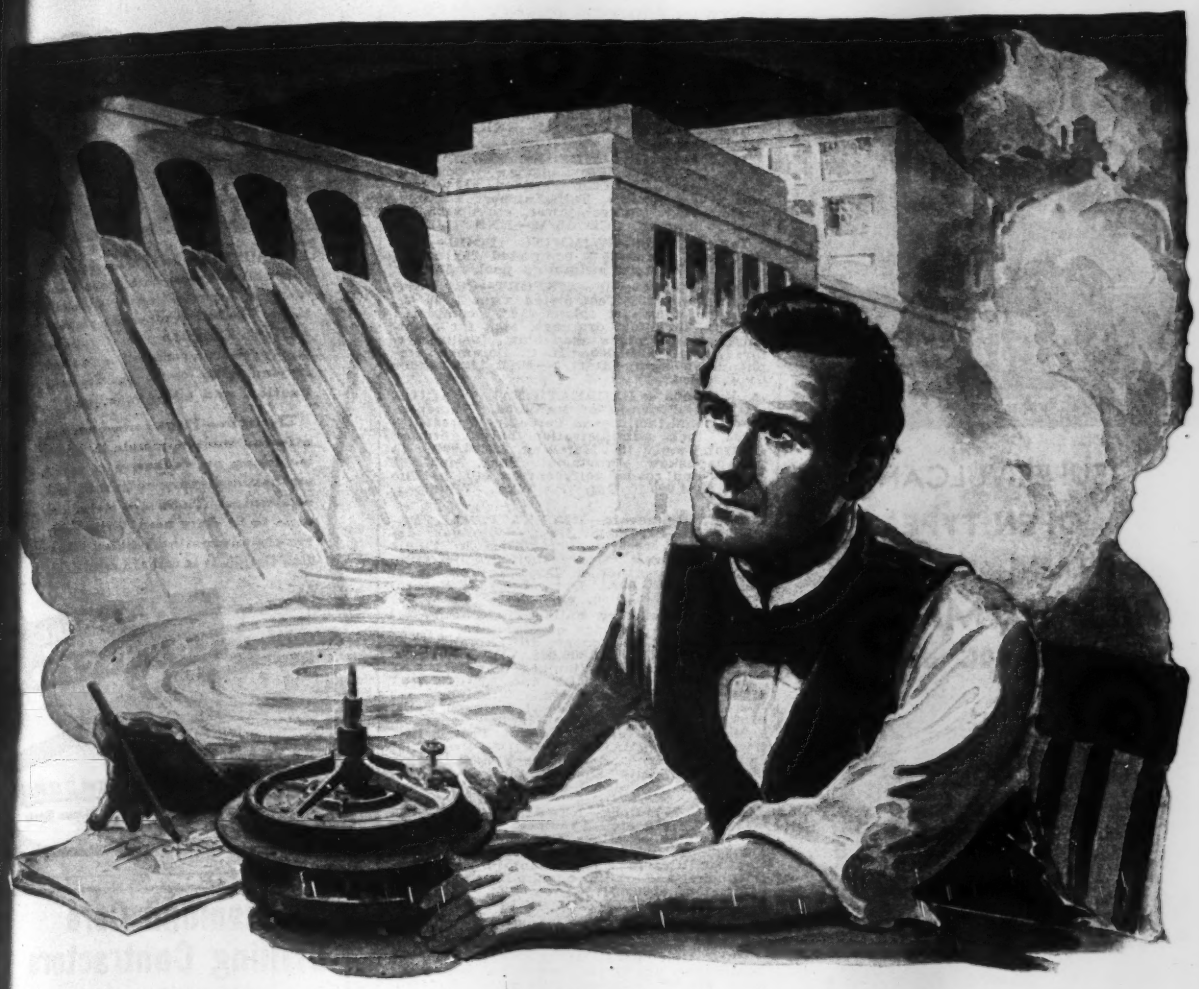
★**Texas., Kansas and Missouri**—PIPELINE —Phillips Peroleum Co., Bartlesville, Okla., plans 1% completed 24 in. natural gas pipeline carrier between Panhandle, Tex. area, Wichita, Kan., and Kansas City, Mo., **$18,000,000.** Financing available. J. McDonald Biddison, **$913** Field Bldg., 135 S. LaSalle St., Chicago 3, Ill., and R. J. Wallace, Tower Petroleum Bldg., Dallas, consult. engrs.

Tex., Dallas—PARK IMPROVEMENTS—City, plans 10% completed imprv. Samuell Park, incl. 9-hole golf course, outdoor concrete swimming pool, athletic courts and diamonds, paved parking spaces, grading grounds development. **$250,000.** Hare & Hare, 114 W. 10 St., Kansas City, Mo., and c/o City Hall, Dallas, consult. engrs.

Tex., Dallas—PARK IMPROVEMENTS—City, City Hall, plans 10% completed imprv. Maple, Cherrywood and Craddock Parks, incl. athletic courts, landscaping, grading, playgrounds, wading pools, roads, etc., **$75,000;** municipal park, Kings Rd., Hartford, in Cedar Springs areas, incl. roads, playgrounds, athletic courts, grading, etc., **$30,000.** Financing provided. Hare & Hare, 114 W. 10 St., Kansas City, Mo., and c/o City Hall, Dallas, engrs.

Tex., Dallas—PARK IMPROVEMENTS—City, City Hall, plans 50% completed. Garrett Park imprvs., incl. drainage, landscaping, athletic courts, wading pool, storm sewers, etc. **$30,000.** Funds available. Hare & Hare, 114 W. 10 St., Kansas City, Mo., and c/o City Hall, Dallas, consult. engrs.

Tex., Goose Creek — STADIUM — Goose Creek Ind. School Dist., Goose Creek, plans by Hedrick & Lindsley, 811 So. Standard Bldg., Houston, 15,000 seating capacity stadium, **$25,000.** Financing not provided.



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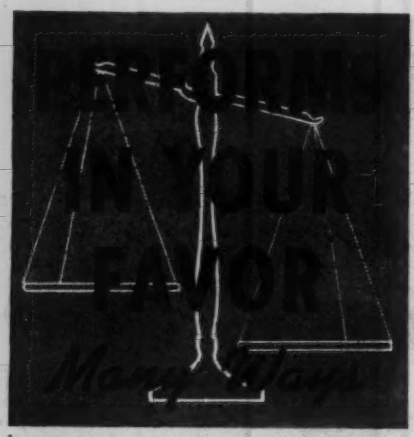

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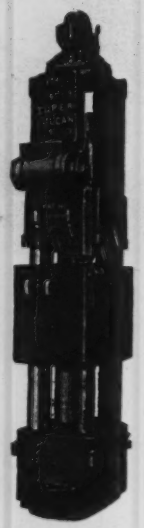

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Tex., Harlingen—HANGAR—C. H. Blackwell, Harlingen, plans 40% completed all steel type hangar, $75,000. A. Tamm, 107 S. 1 St., consult. engr.

Tex., Lampasas—AIRFIELD, etc.—Lampasas Co., c/o Judge, plans 10% completed, constructing airfield and imprvs., $100,000. Partly financed. CD 6/22—ENR 7/6, under Unclassified.

Tex., Longview—AIRPORT BLDG., etc.—Gregg Co., c/o Judge, Longview, plans 40% completed by Voelcker & Dixon, 913½ Indiana Ave., Wichita Falls, airport administration bldg., control tower, etc. $125,000. Partly financed. CD 10/19—ENR 11/2.

Tex., Lufkin—SWIMMING POOL—City, City Hall, plans 25% completed 70x125 ft., rein.-con. outdoor swimming pool. $30,000.

Tex., Stephenville—AIRPORT—City, City Hall, plans 25% completed two 3,000 ft. concrete runways; plans 10% completed grading, levelling, drainage, etc., for municipal airport; plans shop bldg., fueling sys. for airport. $260,000. H. C. Doremus, Stephenville, engr. CD 11/3—ENR 11/9, under Unclassified.

★**Manitoba** — RECREATIONAL FACILITIES—Province of Manitoba, Winnepeg, recreational facilities in Porcupine Forest Reserve, incl. administration bldgs., erosion control, etc., in Mafeking, $200,000; in Athapapuskow Provincial Park, incl. 5 guards and roads, golf courses, etc., at The Pas, $384,000. Dpt. P. Wks., Winnipeg, engrs.

Man., Boissevain—RECREATIONAL FACILITIES—Provincial Govt., Winnipeg, development recreational facilities in Turtle Mountain forest reserve incl. fire detection facilities, construction dams, establishment nurseries, $253,000. Dpt. Mines & Natural Resources, Winnipeg, engr.

★**Man., Boundary Falls (The Pas Postal District)**—Province of Manitoba, 150,000 hp. power development at Lamphrey or Boundary Falls, $11,000,000. Dpt. Mines & Natural Resources, Winnipeg, engr.

Man., The Pas—REEF and LEDGE REMOVAL—Provincial Govt., Winnipeg, removal of reefs and ledges at Sturgeon Falls, $100,000. Dpt. P. Wks., Winnipeg, engr.

Man., White Shell (Kenora Postal District)—FISH REARING PONDS—Provincial Govt., Winnipeg, development fish rearing ponds at White Shell Hatchery, $30,000. Dpt. Mines & Natural Resources, Winnipeg, engr.

★**Man., Winnipeg**—RECREATIONAL FACILITIES, etc.—Province of Manitoba, c/o Ministry of Mines & Resources, Winnipeg, plans under way development recreation facilities in Duck Mountain Park incl. telephone and radio communications, etc., sanitation, $200,000; 2 new fish hatcheries, $120,000; marsh development in Netley area, $250,000; marsh development in Delta marshes south of Lake Manitoba, $150,000-$200,000.

Ont., Galt—SWIMMING POOL—City, C. T. Chesney, acting clk., municipal swimming pool, $40,000. James, Proctor & Redfern Ltd., Excelsior Life Bldg., Toronto, engrs. CD 12/11—ENR 12/28.

★**Que., Montreal** — TRACK IMPROVEMENTS, etc.—Canadian Pacific Ry. Co., J. E. Armstrong, ch. engr., Windsor Station, Montreal, imprv. track, yards and bldgs. vicinity of here. $500,000.

★**Que., Montreal** — YARD IMPROVEMENTS, etc.—Canadian National Rys., H. A. Dixon, ch. engr., 360 McGill St., Montreal, imprv. yards, tracks, bldgs. $1,000,000.

READY FOR BIDS

Fla., Jacksonville— PIPELINES — City, City Hall, plans completed addnl. pipelines and tanks for unloading, storing fuel oil from power plant boilers, $75,000. Financing provided. W. E. Shedden, Engineers Bldg., ch. engr.

N. Y., New York—COMFORT STATION—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, plans completed 1 story comfort station, 1155 Cromwell Ave. $47,000. E. Kebbon, c/o owner, engr.

Okla., Tulsa — TRAFFIC SIGNALIZATION—City, Municipal Bldg., plans completed signalizing 25 intersections, $65,000. Funds available. F. Smith, 1010 E. 8 St., supt. Fire Alarm. W. R. Wooten, Tulsa, asst. city engr.

Tex., Houston—BOWLING ALLEY, etc.—River Oaks Corp., River Oaks Blvd., plans completed 122x148 ft., structural steel frame, brick, concrete bowling alley and storage and bsmnt. $50,000. Funds available. A. W. Stone, Electric Bldg., archt. CD 11/21—ENR 11/30, under Unclassified.

Tex., Port Isabel—DOCKS, etc.—Valent Bros. Fish Co., 955 S.E. Fronton St., plans completed docks and fish storage facilities, $75,000. Funds available. CD 9/27—ENR 10/15, under Unclassified.

Man., Julius—PARK DEVELOPMENT—Province of Manitoba, Winnipeg, plans completed park development, recreational area, $80,000. Dpt. Mines & Natural Resources, Winnipeg, engrs.

★**Man., White Shell (Kenora Postal District)**—RECREATIONAL FACILITIES—Provincial Govt., Winnipeg, plans completed development recreational facilities in White Shell Forest Reserve, incl. summer resort development, office bldgs., and swamp drainage, $733,000. Dpt. Mines & Natural Resources, Winnipeg, engrs.

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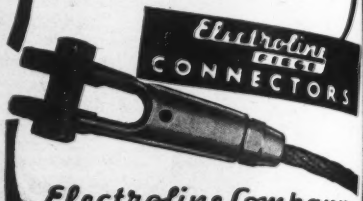

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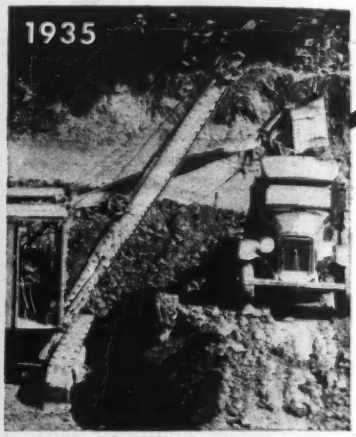
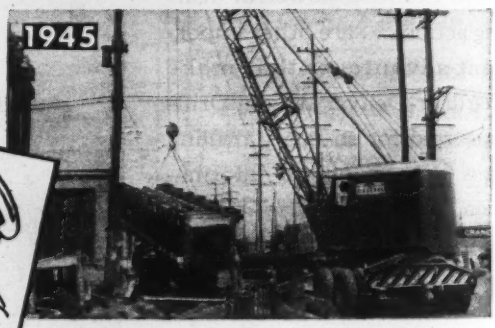
When Peace returns, bringing its great wave of new construction, Generals' dependability and all-around performance will be ready to help you raise your profit sights.

*Official records are incomplete on the other 2%, since many of them have passed from the hands of their original owners without General's knowledge.





WATCH FOR THE NEW GENERAL TYPE 10 ON RUBBER

The Revolutionary, All-Job "Machine of Tomorrow"

THE OSGOOD COMPANY
SHOVELS, DRAGLINES
CRANES
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DIESEL, OIL, GAS, ELECTRIC

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CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — *SCOTT McLEOD, Statistics* — *J. A. MAHONEY, Reports*

(Daily service also available—Write for details)

WATER SUPPLY

PROPOSED WORK

†Fla., Key West — City, WW imprvs., extens. $139,000. **FWA.** Russell & Axon, 4903 Delmar Blvd., St. Louis 8, Mo., engrs.

Fla., New Smyrna—City, WW imprvs., extens. $70,000. Russell & Axon, 4903 Delmar Blvd., St. Louis 8, Mo., engrs.

Idaho, Twin Falls—City, City Hall, exten. water sys. to serve 1,180 acre area recently annexed by city. $140,000. J. E. Hayes, City Hall, city engr.

Mo., Thayer—City, WW imprvs., extens., etc. $25,000. Russell & Axon, 4903 Delmar Blvd., St. Louis, Zone 8, engrs.

†Mo., Waynesville—City, 50,000 gal. elevated water tank on 75 ft. tower, necessary connections to distr. sys., etc. $10,000-$15,000. **FWA.** Russell & Axon, 4903 Delmar Blvd., St. Louis, Zone 8, engrs.

O., Lockland—City, Wyoming and Cooper Sts., plans completed furnishing, installing 8- to 16-in. c.i. watermains. $190,000. A. LeFeber, Temple Bar Bldg., Cincinnati, engr.

Pa., Newtown—Newtown Artesian Water Co., F. Ellis supt., 35 S. State St., preparing plans reservior repairs. $25,000.

BIDS ASKED

Bids Asked Early In February

Mont., Fairfield—City, water sys., incl. elevated steel storage tank, 2 electrical pumps. $70,000. Corwin & Co., Medical Arts Bldg., Great Falls, engrs. CD 8/9—ENR 8/17.

Bids Asked February 13

N. C., Seaboard—Town, at office of L. Spencer, clk., water treatment plant imprvs., furnishing, installing certain bldgs., basins, equip., piping, etc. Plans deposit $5. B. Crocker, Jr., Lawyers Bldg., Raleigh, engr.

Bids Asked February 14

N. Y., New York—Comr. Water Supply, Gas & Electricity, Municipal Bldg., Zone 7, installing 20 in. c.i. watermain to supply Pump 5, and anchoring of 48 in. c.i. main in tunnel at 179 St. pump. sta. Plans deposit $1.

Bids Asked February 27

O., Hillsboro—J. E. McDermott, clk. Bd. Trustees of Public Affairs, R. T. Ramsden, pres., WW imprvs., Contr. A, 1 m.g.c.p.d. complete water treatment plant, low head concrete dam and intake, sludge beds, etc., Contr. B, installing approx. 6,500 ft. 10 in. gravity line, incl. valves, manholes, pipe and fittings, Contr. C, constructing earthen dam with concrete spillway and gate chamber. Plans deposit $15. Burgess & Niple, 568 E. Broad St., Columbus, consult. engrs. CD 11/1—ENR 11/9.

Bids Asked February 27

Wis., Marinette—City, Bd. P. Wks., City Hall, 12 in. water transmission pipeline. Plans deposit $10. Foth, Boyd & Porath, 409 E. Walnut St., Green Bay, engrs. CD 10/17—ENR 10/19.

Bids Asked February 28

Wash., Vancouver—R. Lovette, city clk., City Hall, 250,000 gal. steel water tank, 107 ft. high, 41 and Washington Sts. $25,000. Extended date. Plans deposit $5. M. Ray, City Hall, city engr. CD 1/31—ENR 2/1.

LOW BIDDERS

O., Cleveland—City, S. F. David, dir. P. Serv., City Hall, 16,000 ft. 32 in. rein.-con. main Tiedman Rd., from State Const. Co., Standard Bldg. **$16.20 per ft.** G. H. Hamlin, City Hall, engr.

Tex., Houston—City, M. H. Westerman, secy., City Hall, Jan. 24, 24 in. c.i. watermain from East End plant north to G. H. & H. R. R. and west to connect with 12 in. main in Keller St., from Russ Mitchell, Inc., 2302 Jefferson St., **$39,220.** Est. $35,000.

Tex., Irving—City, E. J. Johnson, mayor, City Hall, Jan. 24, deep test water supply well and pump. unit, from J. L. Myers & Son, 206 W. Commerce St., Dallas, **$17,280.** CD 1/5—ENR 1/11.

Tex., Winters—City, T. A. Smith, mayor, Jan. 26, dam and spillway, from J. W. Hall Const. Co., Denton, **$76,982.** CD 1/19—ENR 1/11.

CONTRACTS AWARDED

Kan., Kansas City—H. Payne, city clk., reconstructing Ohio Ave. pump house, to L. G. Barcus & Sons, 1430 State Ave., $87,287. T. Schluo, city engr. Bids 1/25. CD 12/28—ENR 12/30.

Symbols and Abbreviations Include:

†	Federal Government
★	Project of $500,000 or over
ENR	Engineering News-Record
CD	Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED: (except Streets & Roads): BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR):

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Mont., Sunburst—City, L. L. Bierscheid, clk., City Hall, replacing wooden watermains with steel mains, hydrants, to M. F. Kiley & Sons, east of Butte, **$51,400.** Bids 1/22. Corwin & Co., Ford Bldg., Great Falls, engrs. CD 1/10.

Tex., San Antonio—City, Water Bd., 106 W. Market St., drilling, developing deep test water (artesian) supply well, Conception Park Station, to Dozier & Draper, 120 Taylor St., **$16,500.** Est. $20,000. CD 1/24—ENR 2/1.

Tex., San Antonio—City Water Bd., 106 W. Market St., 2 and 6 in. c.i. waterlines, (El Monte, Howard), force account. **$20,000.**

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Calif., Los Angeles—City, Bd. P. Wks., City Hall, 5,576 lin. ft. vit clay sanitary sewer, house connections, repaving, etc., in Gateway Blvd. and Barrington Ave. Sewer Dist. $39,263. L. Aldrich, City Hall, city engr.

†Fla., Daytona Beach—City, sewage treatment plant, with equip., auxiliaries, appurtenances, and sewer connections. $250,000. **FWA.** Russell & Axon, 4903 Delmar Blvd., St. Louis 8, Mo., engrs.

Fla., Fort Myers—City, rehabilitating sanitary sewerage sys., etc. $270,000. Applied to FWA for grant. Russell & Axon, 4903 Delmar Blvd., St. Louis 8, Mo., engrs.

†Fla., Key West—City, rehabilitating sanitary sewerage and sewage treatment plant. $20,000-$25,000. **FWA.** Russell & Axon, 4903 Delmar Blvd., St. Louis 8, Mo., engrs.

Fla., Winter Haven—City, plans completed sanitary sewerage sys. incl. sewage treatment plant, equip., auxiliaries, accessories, necessary connections. $100,000. Applied to FWA for 50% grant. Russell & Axon, 4903 Delmar Blvd., St. Louis 8, Mo., engrs. CD 4/10—ENR 4/13.

★**Mich., Midland**—Dow Chemical Plant, Midland, waste disposal plant, $570,000.

N. Y., Idlewild—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, bids soon sanitary sewers at airport. $300,000. J. Downer, 30 Rockefeller Plaza, New York, Zone 20, engr.

Tex., Fort Worth—City, storm sewers. Over $40,000.

★**Va., Arlington**—Bd. Comrs. Arlington Co., Court House, sewage disposal plant addns., alterations. $600,000. Alexander Potter Associates, 50 Church St., New York 7, N. Y., engrs.

Que., Causapscal—Municipality, plans prepared sewerage sys. $50,000. Z. Langlais, 105 Mountain Hill, Quebec City, engr. CD 1/30.

★**Que., Charlesbourg**—Municipality, plans prepared sewerage sys. $500,000. Z. Langlais, 105 Mountain Hill, Quebec City, engr.

Que., Granby—Province of Quebec, c/o Ministry of Agriculture, Quebec City, tile drainage. $300,000. Dpt. P. Wks., Quebec City, engr.

BIDS ASKED

Bids Asked March 2

†Me., Bath—City, Treasurer's Office, City Hall, refuse incinerator, incl. 2 furnaces, appurtenances. $100,000. **FWA.** Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs. CD 11/8—ENR 11/16.

Bids Asked in Spring

N. Y., Freeport—Bd. Sewer Comrs., L. Fishel, chn., Municipal Bldg., 46 N. Ocean Ave., altering, imprv. sludge process and filter bldg. at sewage treatment works. Plans deposit $15. Bids 1/16 rejected. N. E. Pearsall, village clk. Baldwin & Cornelius Co., Inc., Freeport, village engr. CD 1/2—ENR 1/4.

LOW BIDDERS

†Va., Hilton Village (br. Newport News)—Bd. Supervs. Warwick Co. at office County Manager, Hilton Village, Jan. 29, Contr. 3, 2,599 lin. ft. sanitary drains, manholes, appurtenances, etc., Va. 44-398, from W. N. Jackson Co., Roanoke, **$169,000. FWA.** CD 1/19—ENR 1/25.

BRIDGES

PROPOSED WORK

La., Thibodaux—Police Jury of Lafourche Parish, Thibodaux, reconstructing pontoon highway bridge across Bayou Lafourche about 3.85 mi. upstream from Yankee (Golden Meadow) Canal, approx. 27.7 mi. above mouth of Waterway in Galiano.

Mo., St. Louis—City, M. M. Kinsey, pres. Bd. P. Service, 304 City Hall, 12 and Market Sts., St. Louis, Zone 1, and St. Louis Co., c/o County Court, Court House, Clayton, St. Louis, Zone 5, rein.-con. bridge to span Gravois Creek on Carondelet Blvd. exten. from Alabama Ave. to Weber Rd. $40,000. W. Crecelius, chief, Bridges and Bldgs. Sect., 301 City Hall, St. Louis, Zone 1.

N. Y., Brooklyn—Bd. Transportation, 250 Hudson St., New York, Zone 13, rejected bids Dec. 12, repairing viaduct structure of Fulton St. Elevated R. R., etc. Pitkin Ave., between Georgia Ave. and Logan St. Will readvertise. CD 12/4—ENR 12/7.

Most Work-*able* Dipper by a Damsite—*or Anywhere Else*

Three purposes are to be served by the Anderson Ranch Dam in Idaho. In addition to flood control, the dam and power plant will supply 500,000 acre feet of water storage and 30,000 KW of hydroelectric power to the Boise Valley.

The site is in a precipitous granite canyon on the South Fork of the Boise River, seven miles from the nearest existing highway. A mountain separated the site from the closest major borrow pit from which fill material could be obtained, making tunneling necessary. The job included 13,000,000 cubic yards of excavation and 7,500,000 cubic yards of earthfill.

One of the shovels employed on this project is shown in picture 1277—a Lima Type 1201 equipped with a 3½ yard Amsco manganese steel renewable lip dipper.

With an Amsco renewable lip dipper on his shovel, the operator knows that he has one designed for fast digging, full loading and quick, clean dumping. He also knows that manganese steel construction is insurance against breakage and rapid wear. The renewable lip feature is another factor of obvious convenience and economy.

Ask for Bulletins 641-D and 641-S on Amsco power shovel dippers and parts.

Above: Amsco renewable lip dipper as made for Lima shovels.

Left: Amsco 3½ yd. renewable lip dipper on Lima power shovel loading earthfill for the Anderson Ranch Dam.

Amsco "Conservation Welding Rods" described in Bulletin 941-W.

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN Brake Shoe COMPANY

BRIDGES (Proposed Work, Cont'd.)

Ore., Taft — Pub. Roads Admin., New P. O. Bldg., Portland, 211 ft. rein.-con. $80,580. W. H. Lynch, New P. O. Bldg., Portland, dist. engr.

Ont., Markham—Toronto & York Road Comn., 57 Adelaide St., Toronto, concrete bridge on road immediately south of here, $43,200. H. C. Rose, c/o owner, engr.

BIDS ASKED

Bids Asked February 20

†D. C., Wash.—At office H. J. Spelman, div. engr., Pub. Roads Admin., 1440 Columbia Pike, Arlington, Va., constructing Proj. ectc 5B6 National Capital Parks, installing 2 steel struts (furnished by U. S. Govt.) between piers of bridge over Boundry Channel at south end of Columbia Island, Mt. Vernon Memorial Hy. FWA. Plans deposit $10; adv. ENR 2/8.

LOW BIDDERS

Ia., Tipton—Bd. Supervs. Cedar Co., Tipton, Jan. 24, one 22x180 ft. I-beam bridge, one 22x150 ft. continuous I-beam bridge one 22x120 ft., continuous I-beam bridge various locations, from A. Olsen Const. Co., Waterloo, **$85,327.** A. R. Bartell, Tipton, co. engr.

CONTRACTS AWARDED

Kansas—State Hy. Dpt., Winfield, substructure Douthitt Bridge, Cowley Co., to L. V. Hites, 200 City Bank Bldg., Kansas City, Mo., **$63,784.** Bids 1/23, awarded 1/29. CD 1/10—ENR 1/18.

★**Oklahoma**—State Hy. Dpt., Capitol, Oklahoma City, rein.-con., bridge, LeFlore Co., to R. R. Tway, 720 E. 19 St., Oklahoma City, **$332,826,** est. $335,000***concrete overpass LeFlore Co., to M. E. Gilliox, Monett, Mo., **$29,509,** est. $32,000***bridge over Elk River, and steel bridge over Cowskin River, both State Hy. 25, Ottawa Co., to Kansas City Bridge Co., Orear Leslie Bldg., Kansas City, Mo., **$171,800** and **$170,535** respectively, est. $200,000 and $160,000 respectively. Grand total $704,670. Bids 1/30, awarded 2/1. CD 1/23.

STREETS AND ROADS

PROPOSED WORK

Puerto Rico, San Juan—City, plans improv. streets and surrounding areas at Health Department, est. $35,000; repairing sidewalks from San Antonio Bridge to Fernandez Juncos Ave., $33,000; completing Guavate Road construction at Cayey, $29,000.

BIDS ASKED

Bids Asked February 16

N. Y., Brooklyn—President Brooklyn Boro. Boro Hall, Zone 2, permanent asphalt on 6 in. concrete repaving Bay Ridge Ave., 58, 67, 72, 92, Boerum, Keap, Hooper, Wilson and Hull Sts.

Bids Asked February 21

Louisiana—State Dpt. Hys., Baton Rouge, sand clay gravel surface course, 39.98 mi. Camp Polk Area Access Roads, S.P. 66-01-04, 66-01-05, 66-02-05, 66-03-05, 139-05-05, 66-03-03, Defense Access Army Reservation Proj. DA-WR 25 (1), iron ore and gravel surface course 10.9 mi. S.P. 133-02-02 and 135-01-01, Defense Access Army Reservation Proj. DA-WR 31 (1), Third Army Maneuver Area Access Roads, both Vernon Parish. Plans deposit $1 each; furnish and spot dump 1,500 cu. yd. washed gravel on certain roads in Ward 1, Richland Parish.

Bids Asked March 2

Alabama—G. R. Swift, state hy. dir., Montgomery, bituminous plant mix, surface treating, liquid seal, light penetration, amiesite and rock asphalt surfacing 12.03 mi. Sect. 1132-A, Colbert Co., 9.62 mi. Sect. 1323-A, Morgan Co.; 13.48 mi. Sect. 1347-A, Lawrence Co.; 11.44 mi. Sect. 1524-A, De Kalb Co.; 6.1 mi. Sect. 2311-A, Etowah Co.; 19 mi. Sects. 2413-A and 2415-A, Walker Co.; 45.6 mi. Sects. 2201-A, 2202-A, 2205-A, 2306-A, Etowah and St. Clair Counties; 5.85 mi. Sect. 108-A, Jefferson Co.; 13.25 mi. Sect. 2326-C, Calhoun and Talladega Counties; 5 mi. Sect. 2105-A, Jefferson Co.; 10.971 mi. Sect. 3518-A, Dallas and Perry Counties; 5.052 mi. Sect. 3114-A, Chilton Co.; 4.391 mi. Sect. 3361-A, Marengo Co.; 13.83 mi. Sects. 3142-A and 3143-A, Pickens Co.; 20.374 mi. Sect. 3422-A, Chilton Co.; 10,417 mi. Sect. 3531-A, Perry Co.; 17.604 mi. Sect. 3401-C, Autauga Co.; 24.85 mi. Sect. 4301-A, Lee and Russell Counties; 12.81 mi. Sects. 4308-A and 4351-A, Lee and Russell Counties; 17.56 mi. Sects. 4423-A and 4428-A, Randolph Co.; 19.95 mi. Sects. 4307-C and 4321-C, Lee and Chambers Counties; 16.69 mi. Sects. 4324-A, 4327-A, 4328-A and 4329-A, Chambers Co.; 11.235 mi. Sect. 4209-A, Talladega Co.; 19.73 mi. Sect. 6301-A, Mobile Co.; 7.54 mi. Sect. 6404-A, Monroe and Wilcox counties; 17.62 mi. Sects. 6303-C and 6401-C, Mobile Co.; 15.517 mi. Sect. 7403-A, Pike Co.; 21.836 mi. Sects. 7501-A, 7502-A, and 7505-A, Butler Co.; 6.535 mi. Sects. 7511-C and 7509-C, Butler Co.; 21.336 mi. Sects. 7612-A, 7621-A, 7622-A and 7625-A, Bullock and Macon Counties; 30.628 mi. Sects. 7704-C, 7705-C, 7715-C and 7751-C, Montgomery and Autauga Counties; 7.45 mi. Sect. 2131-T, Jefferson Co.

STREET AND ROADS (Bids Asked, Cont'd.)

Bids Asked February 14

Louisiana—State Dpt. Hys., Baton Rouge, washed gravel and iron ore surfacing 10.6 mi. Defense Access Army Reservation Proj. DA-WR (1) Hornbeck-Toro Hy., State Route 108 S.P. 357-01-04 and 357-02-03, Sabine and Vernon Parishes; sand clay gravel surface course paving 14.8 mi. Defense Access Army Reservation Proj. DA-WR 37 (1) Burr Ferry-INT. St. Rt. C-1470 Hy., S.P. 132-02-09; 10 mi. Defense Access Army Reservation Proj. DA-WR 37 (1) Int. St. Rt. 138 Burr Ferry Hy., S.P. 132-03-06, both Vernon Parish. Plans deposit $1 each.

Kansas—State Hy. Dpt., Winfield, rejected bids Jan. 29 grading 0.283 mi. Proj. WER-5, Cowley Co. R. C. Keeling, Topeka, engr. CD 1/10—ENR 1/18.

Bids Asked In February Or March

Ill., East St. Louis—City, L. J. Dougherty, street comr., City Hall, Main St. and Missouri Ave., repaving Collinsville Ave., Bway. to St. Clair Ave. and widening same street from Summit to St. Clair Ave., new curb-ing, etc. $125,000.

LOW BIDDERS

California—State Div. Hys., State Bldg., Los Angeles, Jan. 25, imprv. 2.9 mi. San Bernardino Co., from Basich Bros. Constr. Co., 600 S. Fremont Ave., Alhambra, **$60,-100.** CD 1/3—ENR 1/11.

British Columbia—Province of British Columbia, Victoria, island highway revision, Oyster Bay, Vancouver Island, from Campbell Constr. Co., 789 W. Pender St., Vancouver, **$71,612.** Dpt. P. Wks., Victoria, engr.

CONTRACTS AWARDED

Minn., Wheaton—Traverse Co., R. L. Johnson, aud., Court House, graveling roads, Job 4501, to R. Werner, Wheaton, **$36,400.** Bids 1/8.

★**Oklahoma**—State Hy. Dyt., Capitol, Oklahoma City, imprv. LeFlore Co., to Anis Constr. Co., 1506 Exchange Ave., Oklahoma City, **$250,838,** est. $255,000; 3.64 mi. Ottawa Co., to M. E. Gilliox, Monett, Mo., **$276,566,** est. $280,000. Bids 1/30, awarded 2/1. CD 1/21.

Oregon—State Hy. Comn., Salem, 19,300 yd. crushed rock in stockpiles on Cascade and Woodburn-Sandy secondary hys., Oregon City-Molalla-Eagle Creek work production project, Clackamas Co. and 11,870 cu. yd. crushed rock in stockpiles on 4 state hys., Baker rock production project, Baker Co., to Rogers Constr. Co., Dayton, **$40,889** and **$27,-108** respectively. Awarded 1/25. R. H. Baldock, State House, Salem, engr.

Tex., Corpus Christi—City, A. C. McCaughan, mayor, City Hall, asphalt paving Lipan St., incl. drainage for 5-acre area, to Brown & Root, Inc., 1501 Musset St., **$114,898.** Est. 100,000.

Wis., Superior—Douglas Co., Superior, road maintenance on various trunk hys., involving 18,500 cu. yd. sand base, 15,200 cu. yd. crushed gravel surfacing, to O. Wisener, 1110 N. 17 St., **$35,527.** Bids 1/18. C. Hanson, Superior, engr.

B. C. Victoria—Municipality, imprv. Kimta and Songhees Rds., day labor. **$25,-000.**

Ont., Beaverhouse—Garrymac Gold Mines, Ltd., Larder Lake, constructing road from Beaverhouse on T. & N. O. Ry., to General Engineering Co. Ltd., 100 W. Adelaide St., Toronto. Est. **$25,000.**

Ont., Markham—Toronto & York Road Comn., 57 Adelaide St., Toronto, curbing and guttering necessitated by widening Dundas St., and catch basins, day labor. **$46,400.** H. Rose, c/o owner, engr.

EARTHWORK, WATERWAYS

PROPOSED WORK

New York—Long Island State Park Comn., Babylon, bids soon dredging Jones Beach, Nassau Co.

Ont., Markham—Markham Twp., reconstructing 90 small dams on township streams. $35,000.

BIDS ASKED

Bids Asked February 19

Ia., Onawa—Bd. Supervs. **Monona Co.,** constructing drainage district, involving 3 mi. dikes, repairing lateral ditches, laying 24 in. drain tile, clearing, grubbing, approx. 18 acres timber land along Maple River, beginning at bridge over Maple River in Sec. 24 Twp. 84-Range 44 and extending south. Over $25,000. R. A. Rawlings, Onawa, co. engr.

Bids Asked February 20

Massachusetts—Town of Oak Bluffs and Commonwealth of Massachusetts, 100 Nashua St., Boston, repairing rein.-con. seawall and resurfacing sects. Sea View Ave., Oak Bluffs, Martha's Vinyard. $77,000. Plans deposit $5.

Bids Asked February 27

Mo., Marshall—Saline Co., Marshall, drainage ditches, levees incl. excav. drainage ditches and constructing earth levees involving 600,000 cu. yd. and constructing concrete sluiceway, culverts, spillway, pipe culverts. E. I. Myers, 337 Law Bldg., consult. engr.

Bids Asked March 1

†**Washington**—At office Bureau Reclamation, Dpt. Interior, W. R. Young, ch. engr., Denver, Colo., furnishing, del. f.o.b. cars at shipping point or f.o.b. cars Odair, at option of bidder 6 structural steel struts complete with end anchorages for floating fenders near drydock miter-gate opening, Grand Coulee Dam, Columbia Basin Project, Spec. 1793-D.

LOW BIDDERS

†**Calif., Oakland**—U. S. Eng., 74 New Montgomery St., San Francisco, Zone 19, drainage and pumping plant, Job No. 1400 from J. D. O'Connor Constr. Co., 391 Sutter St., San Francisco, **$21,410.**

†**Idaho, Boise**—U. S. Eng., 628 Pittock Block, SW. 10 Ave. and Washington St., Portland, Ore., Jan. 26, repairing, reconstructing levees and revetments along Boise River, from Morrison-Knudsen Co. Inc., 319 Bway., **$44,503.**

★†**Nev., Boulder City**—Bureau Reclamation, Dpt. Interior, Boulder City, Jan. 30, tunnel and river-channel imprvs. at Boulder Dam, Boulder Canyon Project, Arizona-California-Nevada, on Colorado River about 6 mi. northeast of here, Spec. 1089, from Guy F. Atkinson Co., 1103 Heartwell Bldg., Long Beach, Calif., **$2,586,450.** CD 1/3—ENR 1/11.

†**Wash., Prosser**—Bureau Reclamation, Dpt. Interior, H. W. Bashore, comr., Yakima, Jan. 27, earthwork, structures, Yakima Ridge Canal, Station 4712 plus 95.74 to Station 5288 plus 95.5 and Wasteways 6 and 7, Roza Div., Yakima Proj., Div. Yakima Project, 7 to 14 mi. northeast of here, Spec. 1090, from N. Fiorito, 344 W. 48 St., Seattle, Zone 7. **$196,075.**

CONTRACTS AWARDED

Ont., Port Arthur—Manitoba Pool Elevator, Ltd., Wheat Pool Bldg. (Winnipeg, Man., replacement and repairs to revetments, cribwall and docks, to Thunder Bay Harbour Imprvts., Ltd., Port Arthur, about **$27,000.**

LATIN AMERICA

Brazil, Sao Paulo—State of Sao Paulo, Sao Paulo, plans widening 22 mi. Contateira Railway. $500,000.

Brazil—Syndicate c/o Departamento Nacional Da Producao Mineral, Rio de Janeiro, plans developing Scheelite properties in states of Paraiba and Rio Grande do Norte. **$250,000.**

Brazil, Apiai—Republic of Brazil, Rio de Janeiro, plans plant producing refined lead. $150,000.

Colombia—Colombian National Railways, Bogota, plans 1,180 mi. railway Ibague to Armenia, extending Ferrocarril de Pacifico to Cartagena on north and to Pasto on south, extending Ferrocarril de Girardot to Garzon. Bureau Coordination & Transportation, Bogota, engr.

Colombia, Bogota—Lineas Aereas Taca de Colombia, Bogota, plans airport. 2,000,000 pesos.

Colombia, Bogota—Republic of Colombia, Bogota, plans deep channel at mouth of Magdalena River, at Bocas de Ceniza, $300,-000. Dpt. P. Wks., Bogota, engr.

Colombia, Paz de Rio—Republic of Colombia, Bogota, plans developing iron-ore deposits, 16,000,000 pesos. Industrial Development Institute, Bogota, engr.

Cuba, Habana—Republic of Cuba, Habana, plans underground railway sys. $200,000,-000. Dpt P. Wks., Habana, engr.

Ecuador—Republic of Ecuador, Quito, plans irrigation project, Guayas, $500,000; Pichincha, $750,000; Manabi, $100,000; Imbabura, $250,000; Chimborazo, $3,400,000, National Irrigation Bureau, Quito, engrs.

Ecuador, Ambato—Republic of Ecuador, Quito, plans airport. 200,000 Sucres. Dpt. P. Wks., Quito, engr.

Ecuador, Manta—Municipality, plans water purification plant, distribution sys. $750,000. Bureau of Municipal Hygiene, Quito, engr.

Ecuador, Quito—Municipality, plans water purification sys., 37,850,000 litres daily cap., incl. sediment tanks, filters, precipitators, administration bldg., etc. $1,000,000. Bureau of Municipal Hygiene, Quito, engr.

Haiti, Port Au Prince—Republic of Haiti, Port au Prince, reconstructing roads, by day labor. **$160,000** appropriated.

Mexico—Dpt. Pub. Works, Maximino Avila Camacho, dir., Tacuba St., Mexico City, plans constructing highway to connect states of Vera Cruz and Tamaulipas, between cities of Nuevo Laredo and Gomez Farias. $500,000.

Mexico—National Irrigation Commission, Manuel Jasso, Ayuntamiento St., Mexico, City, will construct irrigation, by own forces. **$10,000,000.**

Mexico—National Railways of Mexico, Andes Ortiz, chn., E. Rodriguez y Parra, engr., M.W., 19 Bolivar St., Mexico City, plans construction and repairs railways. $2,500,000.

Mexico—State of Nuevo Leon, Governor Arturo B. de la Garza, Monterrey, plans irrigation throughout the state. $1,000,000.

Mexico—State of Nuevo Leon, Governor Arturo de la Garza, Monterrey, will construct schools at Allende, Teran, and other nearby towns, by own forces. **$300,000.**

Mexico—State of Queretaro, Governor Agapito Pozos, Queretaro, will construct drainage sys. for rural cities, by own forces. **$450,000.**

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6	2.5	3.00	2.25	11.71
8	2.5	4.00	2.25	14.63
10	2.5	5.00	2.25	17.70
12	2.5	6.00	2.25	20.86
14	2.5	7.00	2.25	24.02
16	2.5	8.25	2.25	33.07
18	2.5	9.25	2.25	36.88
20	2.5	10.50	2.25	40.71
24	2.5	13.00	2.50	53.02
30	2.75	16.00	2.50	65.36
36	2.75	19.00	2.50	77.96
48	3.50	30.00	3.00	121.15
54	4.0	38.00	3.00	135.60
60	4.0	42.00	3.00	150.70

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LATIN AMERICA(Cont'd.)

Mexico, Acajete—State of Vera Cruz, Governor Adolfo Ruiz Cortines, Jalapa, takes bids within 45 days, school. $100,000.

Mexico, Las Virgenes—National Irrigation Commission, Oscar R. Enriquez, Ayuntamento St., Mexico City, takes bids within 90 days, constructing irrigation dam, on river San Pedro. $650,000.

Mexico, Mexico City—Cia. E. R. Squibb & Sons de Mexico S.A., Av. Juarez, 4-706, Mexico, D.F., plans plant. $300,000.

Mexico, Mexico City—Federal District, Rojo Gomez, mayor, Monda and Palacio National Sts., will construct sports center, by own forces. **$800,000.**

Mexico, Mexico City—Federal District, Rojo Gomez, mayor, Monada and Palacio National Sts., plans schools in Mexico City and suburbs. $1,600,000.

Mexico, Mexico City—Productoers Asociados Mexicanos, Mexico City, plans movie studio churubusco. $3,000,000 equipped.

Mexico, Mexico City—Sears-Roebuck & Co., c/o Rob. A. Wood, Mexico City, plans converting bldg. into storerooms and offices, $150,000; plans constructing retail store, $150,000.

Mexico, Puebla—L. Cardenas, secy. National Defense, National Palace, Mexico City, constructing military camp, by own forces. **$400,000.**

Mexico, Torreon—City, Edwardo Guerra, Torreon, will construct and repair city streets principally in Colonia Primero de Mayo, La Continental, Torreon, Anexas and La Vencedora Sections by own forces. **$110,000.**

Mexico, Villa de Guadalupe—State of Nuevo Leon, Governor Arturo B. de la Garza, Monterrey, will construct irrigation dam, by own forces. **$100,000.**

Panama, Panama City—City, Ministry of Health & Pub. Works, plans jail, $250,000; reformatory, $300,000; 3 housing projects, $300,000-$400,000 each.

Panama, Panama City—Republic of Panama, Panama City, plans reformatory. $350,000. Dpt. P. Wks., Panama City, engr.

Peru, Tacna—Republic of Peru, Lima, rehabilitating Azucarero Canal. 6,098,178 Soles voted. Ministry of Public Works, Lima, engr.

Panama—Colon Municipality, will construct 15 mi. hy. from Colon to Portobello, by day labor. **$150,000** voted.

Panama, Panama City—Municipality, plans hospital, dormitories, jail. $250,000.

Panama, Panama City—Prophylactic Hospital of Matias Hernandez, Panama City, plans hospital exten.

Panama, Panama City—Republic of Panama, Panama City, will construct communicating roads and reconstruct city streets by day labor. **$1,275,919.** Dpt. P. Wks., Panama City, engr.

Panama, Aguadulce—Republic of Panama, City, plans hospital, nurses home, laundry, etc. $500,000.

Panama, Panama City—Republic of Panama, Panama City, plans bridge construction. $177,478 appropriated. Dpt. P. Wks., Panama City, engr.

Panama, Panama City—Republic of Panama, Panama City, plans three 4 story, rein.-con. tehements. $400,000.

PUBLIC BUILDINGS

PROPOSED WORK

★**†Calif., Campo**—U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 14, expanding Mitchell Army Convalescent Hospital, reconditioning office, messes, housing, post exchange, service club, library, recreation hall, roller skating rink, bowling alleys, landscaping, etc. $543,000.

†Calif., San Francisco—Franciscan Sisters of the Sacred Heart, St. Joseph's Hospital, Park Hall and Buena Vista Ave., rejected bids Jan. 26, 4 story, rein.-con. nurses home and training facilities, Calif. 4-667. **FWA.** Will readvertise. M. J. Rist, Phelan Bldg., archt. CD 1/31, under LB—ENR 10/19.

†Calif., San Francisco—Pub. Housing Auth., NHA, 760 Market St., plans by J. J. Dinwiddie and Kent & Hass, 525 Market St., F. J. McCarthy and J. Francis Ward, 369 Pine St., and W. H. Knowles, 369 Pine St. and F. L. Langhorst, 447 Sutter St., 1,000 unit family dwellings, Calif. 4980. CD 1/26—ENR 2/1.

†Colo., Denver—U. S. Eng., 909 17 St., fuse and booster plant at Denver Ordnance Depot. $100,000.

†Mass., Rutland Heights—Veterans Admin., Vermont Ave., between H and I Sts. N.W., Wash. 25, D. C., tuberculosis hospital addn. To exceed $250,000.

★**†Neb., Grand Island**—Pub. Housing Auth., NHA, 201 N. Wells St., Chicago 6, Ill., housing at Cornhusker Ordnance plant. $1,680,000.

★**†Neb., Hastings**—Pub. Housing Auth., NHA, 201 N. Wells St., Chicago 6, Ill., housing at Hastings Naval Ammunition Depot. $1,800,000. CD 1/17—ENR 1/25.

Nev., Las Vegas—City, City Hall, plans by R. Stanton, Pebble Beach, Calif., 2 story, 161x165 ft. city jail and police bldg. Applied for FWA funds.

†N. J., Carlstadt—Lafayette Mfg. Co., Inc., 45 E. 17 St., New York, N. Y., 1 or 2 story brick steel mfg. plant. $70,000. Defense Plant Corp. will finance.

★**†N. J., Lyons**—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C., hospital. $575,000. Funds appropriated.

N. J., Vineland—Dpt. Institutions & Agencies, Trenton, rejected bids Jan. 11, dormitory addn., at State Hospital. $122,000. CD 1/2—ENR 1/4.

N. J., Woodbine—Dpt. Institutions & Agencies, Trenton, rejected bids Jan. 11, dormitory addn. at State Hospital. $194,000. CD 12/29—ENR 1/4.

N. Y., Grasslands (White Plains)—Bd. Comrs. Westchester Co., White Plains, plans by Staedreier & Zetsche, 175 Main St., White Plains, maintenance bldg. $75,000.

†Ore., Eugene—Pub. Housing Auth., NHA, Skinner Bldg., 5 and Union Sts., Seattle 1, Wash., 50 unit housing. $200,000.

Ore., Portland—School Bd., Dr. W. B. Spalding, supt., Portland, plans by Wolff & Phillips, Pearson 4th Ave. Bldg., Crestor School replacing structure destroyed by fire. $180,000. Seeking FWA funds. CD 1/4—ENR 1/11.

†Okla., Guymon—Pub. Housing Auth., NHA, 1411 Electric Bldg., 7 and Lamar Sts., Fort Worth, Zone 2, Tex., family housing, Okla. 34080.

†Pa., Aspinwall (br. Pittsburgh)—Veterans Admin., Vermont Ave., between H and I Sts. N.W., Wash. 25, D. C., addnl. hospital bldg. $400,000. Funds appropriated.

★**Pa., Ardmore**—Lower Merion School Bd., Ardmore, preparing plans school, Lower Merion, near here. $500,000.

★**†Tenn., Nashville**—Goodyear Tire & Rubber Co., 6500 Mount Elliott St., Detroit, Mich., bids soon 300x1,000 ft., brick, concrete, steel tire factory. $10,000,000. Defense Plant Corp. will finance.

★**†Tex., Houston**—Rheem Mfg. Co., 1402 Lockwood Dr., constructing, equipping mfg. plant. $3,125,000 allotted. Defense Plant Corp. will finance.

†Tex., Midland—Pub. Housing Auth., 1206 Electric Bldg., Fort Worth, 45 family housing units, Tex. 41690.

†Tex., Seagraves—Pub. Housing Auth., NHA, 1411 Electric Bldg., 7 and Lamar Sts., Fort Worth, Zone 2, family housing, Tex. 41689.

★**†Va., Orange**—Snead & Co., Orange, plant. $500,000. Defense Plant Corp. will finance.

†Pa., Phila.—Mercy Hospital, 5000 Woodland Ave., plans by H. R. Robinson, 1827 Ave. N.W., Wash., D. C., and bids soon hospital, school for nurses, alterations, addns., Pa. 36-202. $50,000. **FWA.** CD 6/30—ENR 7/6.

†Pa., Wyomissing—Textile Machine Wks., Wyomissing, plant expansion. $235,000. Defense Plant Corp. will finance.

R. I., Newport—City, Fire Chief, W. Marlboro St., repair shop, W. Marlboro St. $40,000 with equip.

★**Sask., Regina**—Dominion Govt., c/o Ministry of Veterans Affairs, Ottawa, Ont., 100 one and one-half story frame dwellings. $600,000.

BIDS ASKED

Bids Asked Early In February

†Neb., Sidney—U. S. Eng., 909 17 St., Denver, Colo., paving floors of warehouses, Sioux Ordnance Depot. $35,000. CD 1/22—ENR 1/25.

Bids Asked After February 5

†W. Va., Morgantown—Monongalia General Hospital, Morgantown, nurses home. **FWA.** L. D. Schmidt, Professional Bldg., Fairmount, archt. CD 10/4—ENR 10/12.

Bids Asked February 13

†Md., Bethesda (br. Wash., D. C.)—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., U. S. PHS Office Bldg. 8, Md. 18-045-3. CD 11/29—ENR 12/7.

Bids Asked February 14

†Mo., Fort Leonard Wood (br. St. Louis)—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., 1 story, 50x120 ft., civilian assembly and recreation bldg., Mo. 23-322. **FWA.** CD 1/16—ENR 1/18.

Bids Asked February 15

★**†D. C., Wash.**—National Capital Housing Auth., 1737 L St. N.W., 440 unit family dwellings, D.C. 1-13. $2,000,000. Plans deposit $25. Bids Jan. 10 rejected. Saarinen & Swanson, 2017 S St. N.W., archts. CD 1/12—ENR 1/18, under LB.

Va., Goochland—State Purchasing Agent, State Finance Bldg., Richmond, staff house, State Industrial Farm for Women, for State. $464,425. Carneal, Johnston & Wright, Atlantic Life Bldg., Richmond, archts. P. Saunders, Corrections Bldg., Richmond, engr.

Bids Asked February 21

†Va., Norfolk—At office Bureau Community Facilities, Federal Works Agency, 601 State Planters Bank Bldg., Richmond, Zone 13, 13 room addn. Coleman Place School Va. 44-162. $171,700. Plans deposit $5.

Bids Asked About February 21

†Mich., Inkster—Public Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., 1 story recreation bldg., Jim Daly Rd., Mich. 20-275, 1 story recreation bldg., Northland Ave., Mich. 20-366. **FWA.** CD 10/27—ENR 11/2

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PUBLIC BUILDINGS (Bids Asked, Cont'd.)

Bids Asked February 27

Conn., Norwalk—Bd. Educ., Broad River School, addn., New Canaan Ave. $110,000. Plans deposit $15. J. Dahlen, 83 Wall St., archt.

Bids Asked About March 20

†Mass., Bedford—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C., hospital for women. $400,000. CD 5/3—ENR 5/10.

Bids Asked Latter Part of March

Tex., Port Arthur—City, L. Lacy, mayor, City Hall, fire station. $110,500. N. Stewart, Adams Bldg., archt. CD 12/11—ENR 12/14.

LOW BIDDERS

†Calif., Oxnard—Oxnard School Dist. of Ventura Co., Feb. 2, school, Calif. 4-452, from M. A. Imhoff & Assocs., San Gabriel, **$181,960.** CD 1/16—ENR 1/18.

†Mass., Camp Edwards—U. S. Eng., 31 St. James Ave., Boston, hospital expansion, Spec. 19-023-45-NEG 16, from J. Slotnik Co., 33 Newbury St., Boston, **$162,218.** CD 2/5.

★**†Md., Dundalk (br. Baltimore)**—At office Bd. Educ., Baltimore, Towson, Jan. 30, high school, Md. 18-902-C, from John McShain, Inc., 17 and Spring Garden Sts., Phila., Pa., **$738,150.** FWA. CD 1/16—ENR 1/18.

†Mont., Missoula—St. Patrick's Hospital, Missoula, Jan. 27, nurse's home addn. Mont 34-115-N, from A. R. Elliott, Missoula, **$216,834.** FWA. CD 1/15—ENR 1/18.

CONTRACTS AWARDED

†Ill., Forest Park—Amertorp Corp., 7500 Roosevelt Rd., 1 story, 40x140 ft., brick, concrete test bldg., for Navy, to Charles B. Johnson & Sons, 6 N. Michigan Ave., Chicago. CD 1/26—ENR 2/1.

★**†Md., White Oak**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., magnetic laboratory bldgs., outside services, Naval Ordnance Laboratory, NOY 11555, to Harwood-Nebel Constr. Co. Inc., 1520 K St. N.W., Wash., D. C., **$1,114,000.** CD 1/22, under LB.

Minn., Windom—City, M. C. Langley, clk., City Hall, imprv. municipal power plant, furnishing, installing auxiliary equip. and piping, to Fuel Economy Engrg. Co., 510 New York Bldg., St. Paul, **$49,400.** Bids 1/24. J. B. Harris Co., 702 Wesley Temple Bldg., Minneapolis, engr. CD 1/17.

★**†Tenn., Memphis**—Buckeye Cotton Oil Co., 2899 Jackson Ave., design and construction chemical pulp plant, on 4 acre site adjacent to present plant, to H. K. Ferguson Co., Hanna Bldg., Cleveland, O. **$2,200,000.** Defense Plant Corp. will operate.

★**†Tex., Waco**—General Tire & Rubber Co., 1708 E. Market St., Akron, O., doubling capacity rubber tire mfg. plant, to Brown & Root, P. O. Box 3, Houston, **$1,600,000.** Defense Plant Corp. will finance. CD 1/31—ENR 2/1.

COMMERCIAL BUILDINGS

PROPOSED WORK

Calif., San Mateo—Conway & Culligan, c/o J. L. Conrich, archt., 188 Beaumont Ave., San Francisco, forty 1 story wood frame residences, $180,000.

Mo., St. Louis—St. Joan of Arc Catholic Parish, c/o Rev. Michael F. Cronin, pastor, 5821 Pernod Ave., Zone 9, plans by H. P. Hess, 1001 Ambassador Bldg., 411 N. 7 St., Zone 1, and bids soon 3 story, part 1 story, 60 x 180 ft., stone veneer, rein.-con. school addn., enlarging chapel.

N. J., Atlantic City—S. W. Ford, 2418-20 Atlantic Ave., repairing Lyric Theatre. $150,000-$175,000.

Pa., Olyphant—Granada Theatre Co., Olyphant, repairing theatre, apartment. $165,000.

Pa., Phila.—Phila. Elks Club, C. Grakelow, chn., Juniper and Arch Sts., repairing clubhouse. $160,000.

★**Pa., Pittsburgh** — Shadyside Hospital, S. Hammon, in charge, 5230 Center Ave., plans by P. Dowler, 802 Century Bldg., 7 story, bsmnt., brick, tile, hospital addn. $500,000.

Pa., Pottstown—Y. M. C. A., V. F. T. Patterson, secy., King and Evans St., altering Y. M. C. A. bldg. $160,000. Campaigning for funds.

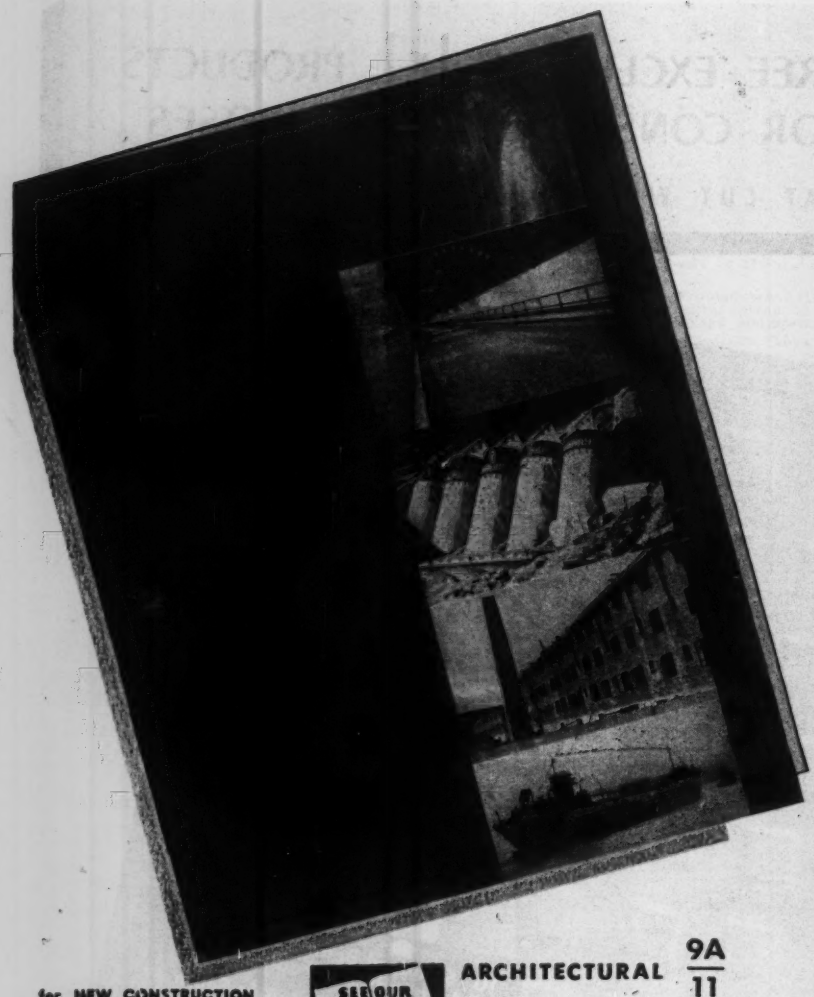
Tex., Alice—Alice Housing Corp., Alice, plans by P. Guyon, Gunter Bldg., San Antonio, 31 frame, 5 room frame cottages. $175,000.

B. C., Victoria—Canadian National Institute for the Blind, Victoria, plans institute for blind. $150,000.

Man., Winnipeg—Knowles Boys Home, c/o Rotary Club, Royal Alexandria Hotel, 100 bed bldg. with physical training facilities, etc. $150,000.

Man., Winnipeg—Manitoba Command, Canadian Legion, 203 Lombard Bldg., Major A. M. Pratt, M.C., chn., plans by M. S. Osborne, University of Manitoba, Winnipeg, legion headquarters, Memorial Blvd. $350,000. CD 11/29—ENR 12/14.

Me., Gardiner—Bd. of Trade, Brunswick, bids soon, 1 story, 50x100 ft., brick, concrete sales and service bldg. Over $40,000. Bunker & Savage, 256 Water St., Augusta, archts.



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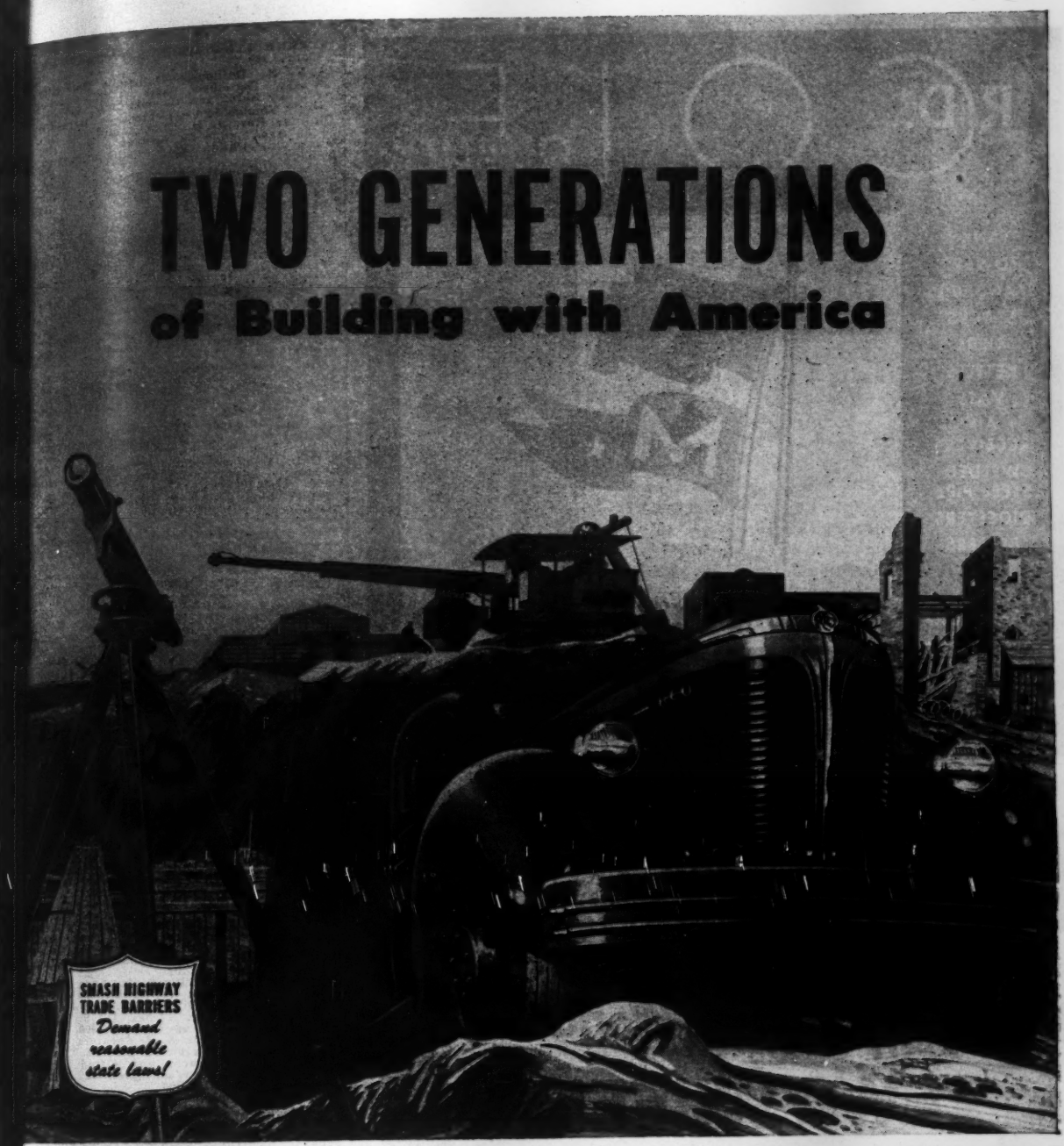

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COMMERCIAL BUILDINGS (Proposed Work Cont'd.)

★**N. S., Dalhousie**—Dalhousie University Bd., Dalhousie, arts bldg. between Archives Bldg. and Cobourg Rd. $500,000.

O., Youngstown — Centenary Methodist Church, Rev. J. H. Ellis, pastor, 415 Belmont Ave., plans by Wenner & Fink, 1701 Arch St., Phila., Pa., rebuilding church. $150,000.

Pa., Phila.—Methodist Episcopal Hospital, F. E. Baker, pres. Bd., Broad and Wolf Sts., plans completed by H. W. Castor, 1518 Walnut St., altering hospital. $150,000.

Va., Arlington — Arlington Methodist Church, Rev. J. S. Johnston, 2607 Columbia Pike, rejected bids Jan. 15, and will revise plans, church and Sunday school. $150,000. Wenner & Fink, 1701 Arch St., Phila., Pa., archts. CD 10/18—ENR 10/26.

Ont., Belleville—Young Women's Christian Assn., Belleville, convalescent hospital. $200,000.

Ont., Forest Hill (Postal Dist. Toronto)—Hillsdale Homes Ltd., 34 Elmsthorpe Ave., bungalows. $150,000.

Ont., Kingston—Kingston General Hospital, Kingston, plans by C. Drever, 81 Brock St., hospital addn. $300,000. H. J. Smith, 62 Charles St. E., Toronto, consult. archt CD 3/9/44—ENR 3/16/44.

★**Ont., Windsor**—Assumption College, 391 Huron Line, library and auditorium addn. $500,000.

Ont., Windsor—Metropolitan Stores Ltd., Windsor, 2 story, bsmnt. store, Ouellette Ave. $200,000.

Que., Lachine—G. F. Rendu, 90 39 Ave., house construction, Broadway Ave. $200,000.

Que., Limoilou—(Postal Dist. Quebec City)—Rev. Sisters of St. Francis d'Assissi, 455 1 Ave., plans by G. F. Caron, 142 St. Jean St., Quebec City, reconstructing administration wing of St. Francois d'Assisi Hospital, 455 1 Ave. $150,000. CD 8/29—ENR 8/31.

Que., Montreal—Shaughnessy Bldg. Co. Ltd., 407 McGill St., office bldg. addn. $200,000.

Que., Quebec City—J. B. Laliberte Inc., 14 Charest Blvd., store and office bldg. $150,000.

Que., Quebec City—Livernois & Co., 7 St. John St., office bldg. addn. alterations. $150,000.

Que., Quebec City—Zellers Ltd., 1252 McGill College Ave., Montreal, plans by Rousseau & Turcott, 308 St. Jean St., 3 story, bsmnt. store. $200,000.

Que., Valleyfield—Seminary of Valleyfield, 169 Champlain St., college exten. $150,000. Architect, c/o Rev. L. Deguire, Valleyfield.

CONTRACTS AWARDED

★**Calif., Compton** — Willowbrook Development Co., 10780 W. Pico Blvd., Los Angeles, five hundred sixty-three 1 story frame, stucco dwellings, Imperial Highway and Central Ave., to Paul W. Trousdale, 10780 W. Pico Blvd., Los Angeles, approx. $3,000,000. Seaboard Engineering Co., 8825 W. Olympic Blvd., Beverly Hills, engrs.

Calif., Emeryville—General Cable Corp., 62 and Green Sts., office and factory bldg. alterations, addns., to Cahill Bros., Inc., 206 Sansome St., San Francisco. Est. $450,000. Corlett & Anderson, Bank of America Bldg., Oakland, archts.

Calif., Lakewood Village (br. Long Beach)—Romwell Co., c/o contractor, 33 frame, stucco duplex dwellings, 23 St. and Lakewood Blvd., to J. P. Rumar, 112 S. LaBrea Ave., Los Angeles, approx. $225,000.

Me., Biddeford—M. & P. Theaters, Biddeford, 2½ story, 70x100 ft. Central Theater, concrete, brick, Beacon and Alfred Sts., to J. J. Convisor, 332 Washington St., Boston, Mass. Approx. $150,000.

N. J., Bloomfield—Essex Housing Corp., 117 Academy St., Newark, twenty-three 2 story, 100 suite, various dimensions, brick veneer garden apartments, Belleville Ave., separate contracts, $325,000. Wm. E. Lehman, 972 Broad St., Newark, archt. CD 10/2—ENR 10/5.

N. J., Caldwell—Mary-Ann Park Corp., 790 Broad St., Newark, 2, 2½ and 3 story, brick veneer on frame garden apartments, to D'Alessio Constr. Co., 790 Broad St., Newark, $275,000. E. A. Schmidlin, 586 Central Ave., East Orange, archt.

Pa., Ambler — Boardman-Smith Corp., 1322 W. Airdrie St., Phila., 32 residences. Owner builds. $160,000. C. H. Fries, 3701 N. Broad St., Phila., archt.

Tex., Alice—Alice Housing Corp., Alice, 31 cottages, frame, concrete pier and beam fdns., etc., to H. L. Cadenhead, 1339 S. Flores St., San Antonio, $175,000. P. Guyon, Gunter Bldg., San Antonio, archt.

Alta., Edmonton—St. Joseph Hospital, 82 Ave., 5 story hospital addn., to H. G. McDonald, 612 Tegler Bldg. $350,000. G. H. MacDonald, 834 Tegler Bldg., arcnt.

INDUSTRIAL BUILDINGS

PROPOSED WORK

Ala., Gadsden—FACTORY—Goodyear Tire & Rubber Co., 1144 E. Market St., Akron, O., and Gadsden, tire factory addn. $300,000. Roberts & Co., Bona Allen Bldg., Atlanta, Ga., engrs.

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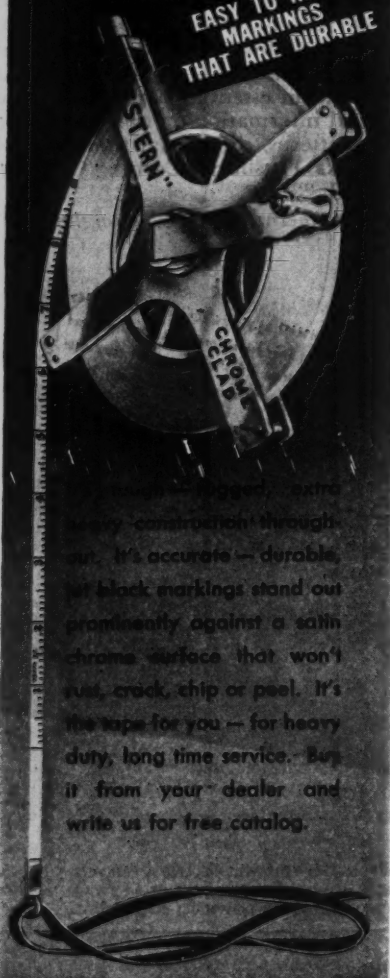

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INDUSTRIAL BUILDINGS (Proposed Work, Cont'd.)

Calif., San Diego — PLANT — Hage Ice Cream Co., 835 K St., plans by F. L. Hope, Jr., San Diego Trust & Savings Bldg., remodeling, expan. facilities, modernizing mechanical sys., etc., ice cream plant. $100,000. E. C. Hillman, Jr., 816 W. 5 St., Los Angeles, engr.

Calif., San Jose—FACTORY, etc.—R. H. Rundle, 810 Polemus St., 1 story, mezzanine, 90x120 ft., rein.-con. factory and office, $60,000. Binder & Curtis, 3535 W. San Carlos St., archts.

Conn., East Hartford—FACTORY—Universal Mfg. Co., 712 Conn. Blvd., 4 story factory reconstruction. $100,000.

Del., Dover—PLANT—R. Dulany, Exmore, Va., plans by Ballinger Co., 105 S. 12 St., Phila., Pa., frozen food plant addn. $75,000.

Ky., Louisville — PLANT — United Engineers & Constructors, Inc., engr., S. Cook, proj. engr., 1401 Arch St., Phila., Pa., soon lets contract feed recovery plant, for Park & Tilford, Francis McDonald, plant mgr., 35 and Tyler Sts. $250,000.

★**Ill., Chicago**—PLANT — Inland Rubber Corp., 146 W. 27 St., plans by Giffels & Vallet, Inc., 242 Congress St., Detroit, Mich., fire mfg. plant. $5,000,000.

La., Roanoke — PLANT — Farmers Rice Drier Co-Operative, Welsh, 38,000 bbl. rice drying plant, and provision for processing approx. 15,000 acres rice harvested by combine. $90,000. Central Eng. Co., 1210 Texas Ave., Houston, Tex., engr.

Mass., Gardner—FACTORY—Korb's Chair Co., J. Korbuszewski, Garden, rebuilding 2 story frame factory.

Me., Bangor—TERMINAL GARAGE — Hasey's Maine Stage, 15 Poplar St., sketches by Prentiss & Carlisle Co., Inc., 12 Hammond St., 1 story, mezzanine, 60x110 ft., brick, concrete, terminal garage, Bway. $40,000.

Mich., Detroit — PLANT — Winter Bros. Stamping Co., 7351 Lyndon St., plans prepared brick, steel, concrete metal stamping plant. $75,000.

Mich., Saginaw—REFINERY—Louis Rose Refining Co., 7177 North Washington St., making plans refinery addn. increasing capacity by 2,500 bbls. per day, incl. cracking plant, piping and tanks. $150,000.

N. J., Atlantic City—LAUNDRY—Steelman's Laundry, 221-25 N. Vermont Ave., repairing laundry. $150,000.

N. Y., New York—GARAGE—General Theological Seminary, 175 9 Ave., soon lets contract, garage, 21 St. and 10 Ave. C. L. Calhoun, 101 Park Ave., New York, Zone 17, archt., CD 1/17—ENR 1/25.

N. C., Greensboro — PLANT — Container Corp., 111 W. Washington St., Chicago, Ill., plans by M. S. Carstens, 1 N. La Salle St., Chicago, Ill., 1 and 2 story, 200x300 ft., brick, rein.-con., steel factory and office bldg. $275,000. CD 12/21—ENR 2/28.

N. H., New London—GARAGE—A. Stanley Little, New London, rebuilding garage, recently destroyed by fire. $40,000.

N. H., South Tamworth—MILL—South Tamworth Industries, Inc., South Tamworth, rebuilding mill, recently destroyed by fire. $75,000.

O., Cleveland — FACTORY — Phoenix Ice Machine Co., H. E. Bollinger, pres., 2711 Church Ave., plans by W. G. Caldwell, Engineers Bldg., 1 story, 95x134 ft., brick, steel factory. $40,000.

Pa., Chester—PLANT—Reading Co., E. Y. Allen, ch. engr., Reading Terminal, Phila., Zone 1, making plans repairing brick plant. $50,000.

Pa., Coatesville—PLANT—Lukenweld Inc., J. Morris, plant engr., Coatesville, plans completed altering mfg. plant. $40,000.

Pa., Erie—PLANT—Hays Mfg. Co., W. H. Forrester, pres., 801 W 12 St., 1 story, concrete block, shell plant addn. $40,000.

Pa., Greenville — FACTORY — Greenville State Car Co., V. O. Lowry, act. mgr. in charge, Greenville, rebuilding section 80x285 ft. factory roof repairs. $75,000.

Pa., Lansdowne — PLANT — Good Health Associates, Inc., Wycombe Ave. and Penna. R.R., repairing 2 story plant. $45,000.

Pa., Milton—BOILER ROOM—Chef Boy-R.-D.-Quality Foods Co., Milton, boiler room. $60,000.

★**Pa., Phila.** — TEXTILE MILL — Harm-Bromiley, W. Harm, pres., Adams Ave. and Leiper St., repairing Textile Mill 1, $400,000; Textile Mill 2, $75,000; Textile Mill 3, $75,000; Textile Mill 4, $50,000.

Pa., Phila.—WAREHOUSE, etc.—Keystone Pickling Wks., 459 N. 2 St., repairing warehouse and bottling bldg. $50,000.

Pa., Phila.—WAREHOUSE—Railway Express Agency, Inc., 18 and Market Sts., 6 story warehouse. $175,000.

Pa., Phila.—OIL PLANT—Reading Co., E. Y. Allen, ch. engr., Reading Terminal, Phila., Zone 1, soon lets contract, general contract oil plant repairs, $100,000. Tentative date.

Pa., Phila.—BAKERY—Rugeriis & Belfonte, 417-23 N. 64 St., repairing 4 story bakery. $85,000.

Pa., Phila.—PLANT—Henry Schmidt & Bros. Inc., 328 Vine St., repairing Mfg. Plant 1, 328 Vine St., $100,000; Plant 2, 326 Vine St., $75,000; Plant 3, 324 Vine St., $75,000.

Pa., Phila. — PLANT — Troco Lubricating Oil Co., 2728 Salmon St., repairing 3 story plant. $75,000.

Pa., Phila.—PLANT—Philco Corp., T... and C Sts., 1 story, brick industrial plant. $100,000.

★**Pa., Williamsport** — PLANT — Avco Corp., Spencer Heater Div., Williamsport, compressor bldg., altering foundry and installing addnl. equip. Total est. $612,...

Pa., Pottstown — FACTORY — Firestone Tire & Rubber Co., W. H. Early, proj. mgr., Box 690, plans by Giffels & Vallet, Inc., R. Rossetti, associate engrs.-archts., 1,000 Maquette Bldg., Detroit, Mich., tire factory addns., alterations. $50,000 to $75,000.

Pa., Susquehanna — PLANT — Evening Transcript, Susquehanna, repairing 1 story plant. $165,000.

Pa., Wyncote—PLANT—Rhodes Chemical Corp., South and Paxon Aves., repairing mfg. bldg. $40,000.

Pa., York—PLANT—Edward Fox Baking Co., N. George St., repairing 4 story plant. $150,000-$175,000.

Tex., Abilene—EQUIPMENT and STORAGE—E. L. Thornton, Abilene, plans by Hughes & Olds, 158½ Cypress St., Abilene, machinery equip. and storage bldg. $40,000.

Tex., Bay City—PLANT—Bay City Rice Drying Co., Bay City, c/o Engineers Office, soon lets contract 30,000 bbl. rice drying plant. Central Engineering Co., c/o A. Van Zyverden, Larendon Bldg., 1210 Texas Ave., Houston, engr. CD 12/7—ENR 12/14.

Tex., Dallas—SERVICE and STORAGE, etc.—B. Griffin, 1616 S. Ervay St., 1 story, 150x205 and 12x50 ft., mezzanine, brick, concrete, etc., auto service and storage bldg., $50,000; plans by A. E. Thomas, Construction Bldg., Dallas, concrete, hollow tile warehouse, $40,000.

Tex., Dallas—WAREHOUSE—Screw Products Co., 2609 Ross St., plans by G. Gill, Great National Life Bldg., warehouse, $40,000.

Tex., Houston — PLANT — Uvalde Rock Asphalt Co., 1705 Oliver St., 1 story, steel frame plant unit, concrete fdn., etc. $43,000. N. Gatoura, Electric Bldg., engr.

Tex., San Antonio—POWER STATION, etc.—Pub. Service Bd., N. St. Marys St., electric power distr. station, $83,000; electric power distr. station, $75,000; 2 mi. 3-conductor electric power distr. line, $25,000.

Wis., Shawano — GRAIN ELEVATOR — Equity Feed Cooperative, Shawano, plans by J. F. Dreger, 188 Waugoo St., Oshkosh, rein.-con. grain elevator, 70 ft. high.

Alta., Athabasaka — POWER PLANT — Dominion Electric Power Corp., Jasper, power plant addn. $40,000.

Alta., Jasper—POWER PLANT—Dominion Electric Power Corp., Jasper, power plant exten. $50,000.

Alta., Lethbridge—REFINERY—Lethaia Oil Refineries, Ltd., 301 Grain Exchange Bldg., Calgary, refinery exten.

B. C., Lillooet—PLANT—Lillooet Packers Ltd., Lillooet, canning, cold storage, pickle and jam mfg. plant. $50,000.

B. C., Mission City — SAWMILL — Green Mountain Sawmill Co. Ltd., 447 Main St., sawmill, etc. $40,000.

B. C., Port Alberni — PLANT — Bloedel Stewart & Welch, Port Alberni, 50,000 tons yearly capacity sulphate pulp plant. $300,000.

B. C., Vancouver—FACTORY—Hammond Furniture Co., 890 Clarke Dr., factory. $41,000.

N. S., Halifax — WAREHOUSE — McColl Frontenac Oil Co., Ltd., 1563 Barrington St., 1 story, 50x112 ft., brick warehouse for oils and greases, concrete fdn. Est. about $50,000.

Ont., Barrie—FACTORY—Canadian General Electric Co., Ltd., 212 King St. W., Toronto, plans by Beck & Eadie, 220 Bloor St. W., Toronto, 1 story, electrical appliance factory and 2 story, office bldg., brick, steel, concrete fdn. Major J. R. Dudley, mgr. Chamber of Commerce, interested.

Ont., Brantford—PLANT—Keeprite Refrigeration Ltd., c/o J. G. McMillen, electrical engr., Brantford, mfg. refrigeration plants, etc. $50,000.

Ont., Burks Falls—DIAMOND DRILLING—Laroma Midlothian Mines Ltd., diamond drilling, Matachewan Dist. $100,000.

Ont., Cannington—FACTORY—Cannington Cereal Industries, Ltd., Cannington, T. H. Stinson, K. C., pres., and F. A. Park, mgr., Cannington, reconstructing 2 story factory. $45,000. CD 10/23—ENR 10/26.

Ont., Chatham — GRAIN ELEVATOR — Maynard Inc., Chatham (Harwich Twp.), grain elevator. $50,000.

Ont., Dundas—PLANT—J. F. Crowley Co. Ltd., J. F. Crowley, in charge, Dundas, iron, steel, wood products plant. $50,000.

Ont., Kirkland Lake—DAIRY, etc.—Lindfors Dairy Ltd., c/o O. L. Archer, Kirkland Lake, dairy and dairy products plant. $50,000.

Ont., Kingston—FACTORY—Canadian Industries, Ltd., Beaver Hall Hill, Montreal, Que., nylon yarn factory. $150,000.

Ont., Leaside (Postal Dist. Toronto)—MILL, etc.—J. R. Short Milling Co. (Canada) Ltd., 80 King St. W., Toronto, plans by G. S. Adamson, 96 Bloor St. W., Toronto, 3 story, bsmnt., 40 x 50 ft. mill, 1 story, 50 x 120 ft. warehouse, 1 story, 50 x 56 ft. office, steel, brick, tile. $100,000.

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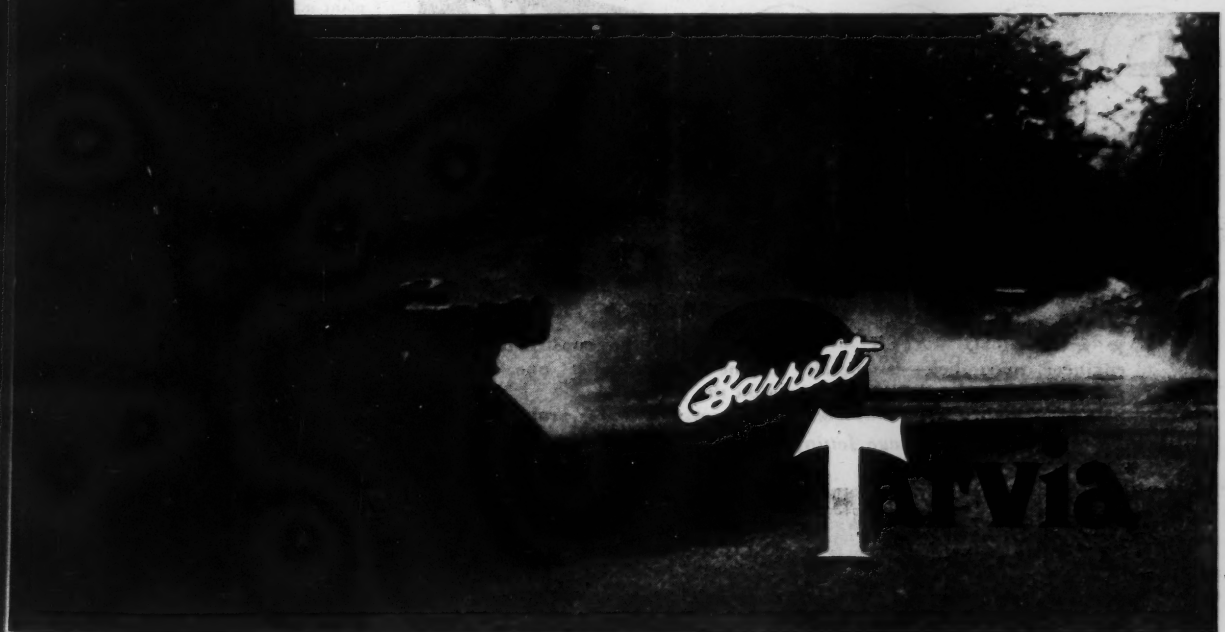

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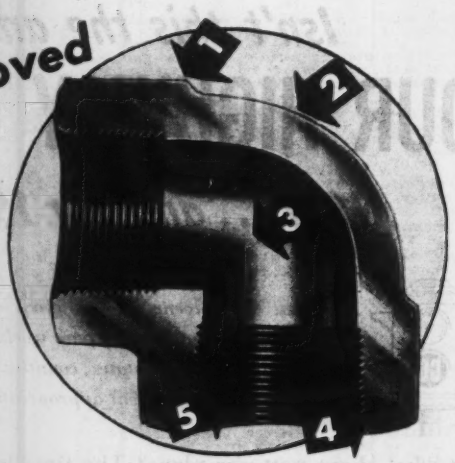

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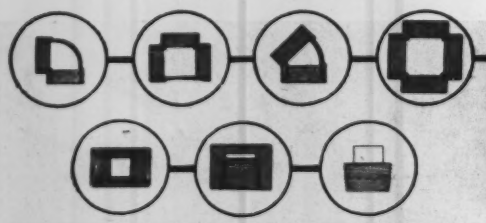

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INDUSTRIAL BUILDINGS (Proposed Work, Cont'd.)

Ont., Porcupine—DIAMOND DRILLING—Wakemac Denton Mines, Ltd., 26 W. Adelaide St., Toronto, surface development and diamond drilling in Denton Twp. $70,000.

Ont., Preston — FACTORY — Kraftaator Products Ltd., C. M. Fouse, pres., Hamilton St., plans by W. H. E. Schmaltz, 129 W. King St., Kitchener, plant extens. $50,000. CD 12/13—ENR 12/28.

Ont., Sarnia — GARAGE — Imperial City Motors, J. N. Whitty, mgr., George and Christina Sts., reconstructing garage. $30,000.

Ont., Swansea — PLANT — Syndicate, c/o Town Clerk, Swansea, central heating plant, laying conducting pipes on town streets.

Ont., Timagami — POWER PLANT — Temiskaming & Northern Ontario Ry. Comn., S. B. Clement, ch. engr., North Bay, power plant. $40,000.

Ont., Toronto—FACTORY—Armwood Mfg. & Sales Co. Ltd., c/o S. H. Baker, 19 Millbank St., factory. $40,000.

Ont., Toronto—PLANT—Art Press & Specialties Ltd., c/o J. H. Amys, 357 Bay St., engraving, lithographing, etc. plant. $50,000.

Ont., Toronto—FACTORY—Canadian General Electric Co. Ltd., 212 King St. W., factory addn. $470,000 incl. equip.

Ont., Toronto — RAILWAY BLDG. — Canadian Pacific Ry. Co., J. E. Armstrong, ch. engr., Windsor St., Montreal, Que., soon lets contract, 1 story, 32 x 178 ft., brick, concrete, rein.-con., tile yard office. Parkdale Yards. $50,000.

Ont., Toronto—PLANT—Chica Exploration & Development Co. Ltd., c/o J. R. Hetherington, 10 E. Adelaide St., mining and milling development plant. $40,000.

Ont., Toronto—FACTORY—L. Davis Textiles Ltd., c/o B. M. Singer, 55 York St., textile factory. $40,000.

Ont., Toronto — DIAMOND DRILLING — Goldbeam Mines Ltd., 75 Summit Ave., underground work, diamond drilling program. $70,000.

Ont., Toronto—PLANT—Higgs Paper Box Co. Ltd., c/o V. W. Price, Federal Bldg., paper box and other paper products mfg. plant. $40,000.

Ont., Toronto—PLANT—Ideal Printing Co., Ltd., 36 Lombard St., printing, etc. plant. $50,000.

Ont., Toronto—WAREHOUSE—Industrial Iron Machinery Co. Ltd., 436 Cherry St., plans by Kaplan & Sprachman, 305 Dundas St. W., 1 story, bsmnt., 50x100 ft., brick, steel, concrete block warehouse, 139 Dufferin St. $45,000.

Ont., Toronto—FACTORY—Eli Lilly & Co., Inc., Terminal Warehouse Bldg., plans by Mathers & Haldenby, 96 Bloor St. W., factory. $45,000. CD 11/7—ENR 11/9.

Ont., Toronto — FACTORY — Title Dress Co., Ltd., 355 W. Adelaide St., factory. $40,000.

Ont., Toronto—FACTORY—Zuckerman & Co., Inc., 352 W. Adelaide St., factory. $40,000.

Ont., Windsor—PLANT—Daley Household Appliances Ltd., c/o G. A. Yates, Windsor, plant mfg. iron, steel, galvanized metals and plastic articles. $40,000.

Ont., Windsor—ELEVATOR, etc.—Hiram Walker & Sons, Ltd., Windsor, elevator, $75,000; dock, railway trestle and tracks on Detroit River, $100,000.

Que., Belleterre—DIAMOND DRILLING—Mudlac Gold Ltd., Belleterre, diamond drilling program. $60,000.

Que., Duparquet—DIAMOND DRILLING—Duquesne Mining Co. Ltd., Duparquet, diamond drilling program. $100,000 available.

Que., Lachine (Montreal)—LAUNDRY—Lachine Hand Laundry Ltd., Lachine, laundry. $40,000.

Que., L'Ange Garchien (Postal Dist. Quebec City)—FACTORY—J. A. Coulambe & Co. Ltd., 126 St. Peter St., Quebec City, reconstructing factory. $40,000.

Que., Louvicourt (P.O. Pascalis)—DIAMOND DRILLING—Dorgass Gold Mines Ltd., Louvicourt, diamond drilling program and addnl. magnetometer surveys. $70,000.

Que., Montreal — FACTORY — Fastlock Fasteners Ltd., 235 S. Lacombe St., factory. $40,000.

Que., Montreal—PLANT—Peckovers Ltd., 77 Front St., Toronto, Ont., plans by J. C. Meadowcroft, 1154 Beaver Hall Sq., plant exten. $50,000.

Que., Quebec City—LAUNDRY—Imperial Laundry Ltd., St. Vallier St., plans laundry. $50,000.

Que., St. Johns—PLANT—Tillotson Rubber Co. Ltd., St. Johns, plant., $40,000.

Que., Val d'Or—DIAMOND DRILLING, etc. —Vinray Malartic Mines Ltd., Val d'Or, diamond drilling and camp bldgs. $60,000.

BIDS ASKED

Bids Asked After February 1

Pa., Marcus Hook—PLANT—O. Fisher, archt., 103 Park Ave., New York, N. Y., mfg. plant alterations, imprvs., for General Chemical Co., H. W. Winters, ch. engr., Marcus Hook, P. R. Scherzinger, purch. agt., 40 Rector St., New York, N. Y. CD 12/22—ENR 12/28.

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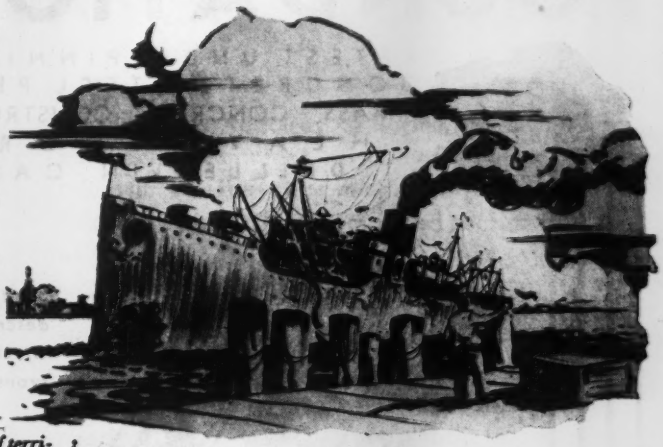

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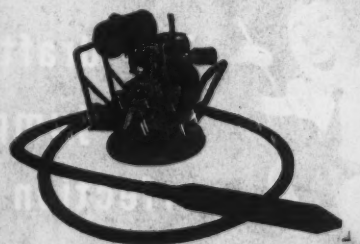

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INDUSTRIAL BUILDINGS (Bids Asked, Cont'd.)

Bids Asked February 12

Pa., Jeannette — PLANT — Pennsylvania Rubber Co., Jeannette, 1 story rubber goods addn. Over $40,000. Fletcher Thomson, Inc., 211 State St., Bridgeport, Conn., engr. CD 1/8—ENR 1/11.

Bids Asked February 13

Conn., Plainville — FACTORY — H. F. Ludorf; archt., 410 Asylum St., Hartford. 1 and 2 story, 50 x 100 ft. and 40 x 56 ft., brick, steel, concrete factory, East St., for Job Plating Co., 136 East St. $40,000. CD 2/1.

Bids Asked February 15

Ky., Midway—PLANT—United Engineers & Constructors, Inc., engr., 1401 Arch St., Phila., Pa., feed recovery plant, for Park & Tilford, Francis McDonald, plant mgr., 22 and Tyler Sts., Louisville, Ky. $350,000. Tentative date.

N. J., Newark—FACTORY—Federal Razor Blade Co., 97 Francis St., 2 story, brick, steel factory, $40,000 plus. E. McMurray, 966 Stuyvesant Ave., Union, archt.

Ont., Toronto — LABORATORY — N. A. Armstrong, archt., 19 Melinda St., 1 story, bsmnt., 50 x 75 ft., rein.-con., brick, laboratory, Davenport Rd., near Avenue Rd. for Radium Luminous Industries, Ltd., 191 Church St. Est. about $50,000. CD 1/6—ENR 12/14.

Bids Asked February 17

La., Welsh—STORAGE PLANT—Kleinman Bros., Welsh, c/o Engineer's Office, 100,000 bbl. rice drying and concrete storage plant. Central Engineering Co., c/o A. Van Zyverden, Larendon Bldg., 1210 Texas Ave., Houston, Tex., engr.

Bids Asked in Spring

Ont., Port Arthur—FACTORY—Hinspeter Harness & Tent Co., Ltd., Port Arthur, factory. $50,000.

Bids Asked

Pa., Sharon — PREHEAT FURNACE — Sharon Steel Corp., W. Jackson, genl. works mgr., S. Irwin Ave., 32x40 ft. preheat furnace to heat 8- to 22-in. slabs, incl. concrete and arch work, electric furnace. $160,000.

R. I., East Providence (br. Providence)—GARAGE—W. C. Viall, 912 Broadway, 1 story, 74 x 98 ft., concrete, brick garage, equip. $40,000. M. Traficante, 125 Grosvenor Ave., archt.

R. I., Providence—WAREHOUSE—American Luggage Works, I. and S. Kolker, 1 Mashapaug St., 3 story, 65x400 ft. warehouse changes, imprvs., Elmwood Ave. $40,000.

Del., Harrington — PLANT — Harrington Ice Co., H. F. Murphy, Harrington, repairing ice plant. $40,000.

Ont., Toronto — DIAMOND DRILLING — Lloyd Long Gold Mines, Ltd., 67 Yonge St., diamond drilling in mining property, Long Lac Area. $60,000.

LOW BIDDERS

Ore., Salem—PACKING PLANT—Producers Cooperative Packing Co., W. H. Wood, mgr., Salem, rebuilding cannery packing plant, from Barham Bros., 1432 State St. Est. **$100,000.** CD 12/5—ENR 12/7.

CONTRACTS AWARDED

Calif., Bakersfield—GARAGE—C. Vigario, Bakersfield, 75x92 ft., hollow concrete block, wood trusses, etc., garage bldg., to A. Hansen, 2328 19th St., **$40,000.** R. V. Derrah, 9470 Santa Monica Blvd., Beverly Hills, archt.

Calif., Modesto — PLANT — Modesto Refrigerating Co., 220 Grand St., 1 story, rein.-con., structural steel beam, etc. food processing and cold storage plant, to Swinerton & Walberg Co., 225 Bush St., San Francisco. To exceed **$40,000.** Phillips Refrigeration Products, Inc., 444 Potrero Ave., San Francisco, prepared plans.

Calif., Los Angeles—WAREHOUSE—Santa Fe Land Improvement Co., 331 Central Bldg., 1 and part 2 story, 56x600 ft., brick, rein.-con. warehouse, 2529 E. 14 St., to Wm. P. Neil Co., 4814 Loma Vista Ave., **$88,000.** H. T. Miller, 4814 Loma Vista Ave., archt.

Calif., San Pedro—SHOP—California Ship Building Corp., Terminal Island, repairing fire damaged 2 story, 150x180 ft., sheet metal shop, own forces. **$50,000.**

Ill., Mattoon—FACTORY—Gar Wood Industries, 7924 Riopelle St., Detroit, Mich., 1 story, 100 x 600 ft., brick, rein.-con., steel factory, to R. J. Vrooman & Co., 6422 Cass Ave., Detroit, Mich. J. A. Stromberg, 140 S. Dearborn St., Chicago, archt.

Ill., Utica — BOILER HOUSE — Phila. Quartz Co., 121 S. 3 St., Phila., Pa., boiler house, to Schless Constr. Co., 176 W. Adams Ave., Chicago. **$40,000.** Awarded 1/25.

Mass., Charlestown (sta. Boston)—STORAGE—Linde Air Products Co., 441 Stuart St., Boston, brick, storage bldg., Charlestown Navy Yard, to L. H. McIsaac Co., 40 Gordon St., Allston, Est. **$40,000.** CD 1/25—ENR 2/1.

Mass., Leominster — FACTORY — Wachusetts Realty Co., Main St., 2 story, brick, concrete factory, to Farina Bros., Inc., 61 Bridge St., Newton. Est. **$40,000.** CD 8/8—ENR 8/10.

Mich., Highland Park — PLANT — Todd Steel Corp., 15843 Second Blvd., brick, steel, concrete, steel plant addn., to O. W. Burke Co., 1001 Fisher Bldg., Detroit, Zone 2, Est. **$75,000.**

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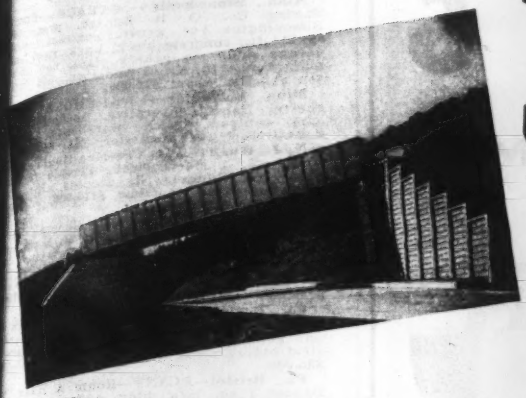

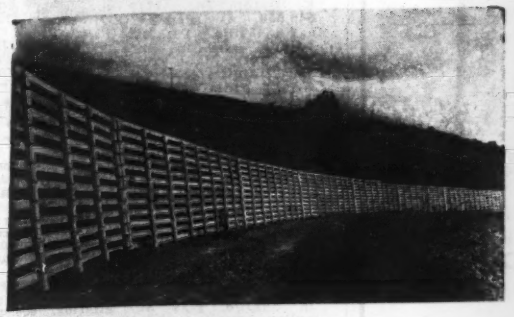

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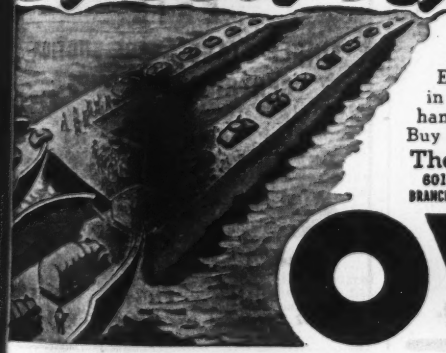

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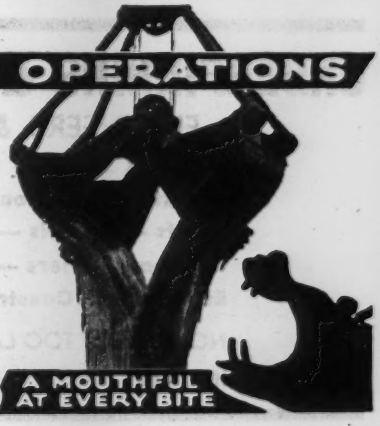

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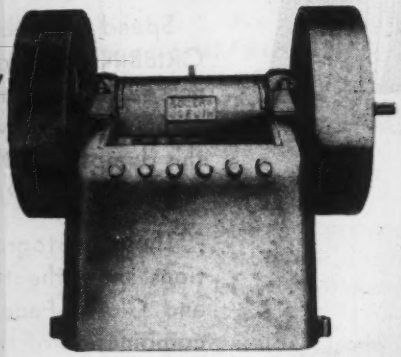

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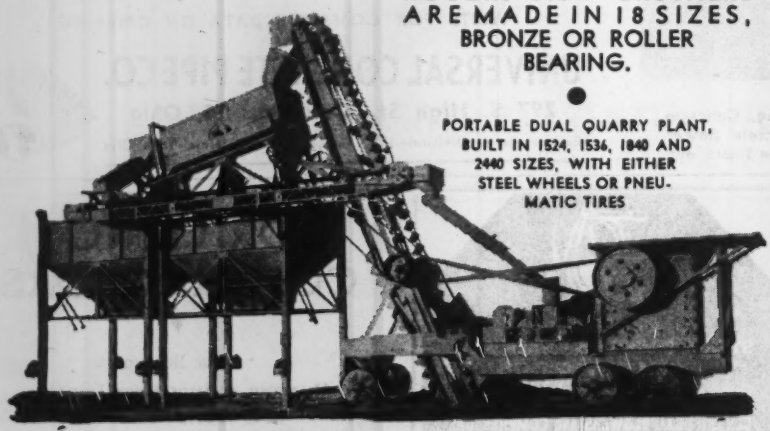

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INDUSTRIAL BLDGS. (Contracts Awarded. Cont'd.)

Minn., Minneapolis — GARAGE — Emrich Baking Co., O. R. Emrich, pres., 2607 Bloomington Ave., general contract 1 story, 95x123 ft., concrete block, brick, steel beam garage addn. to bakery plant, new steam plant, etc., to Kraus-Anderson, 501 South 8th St. Est. about $70,000.

Minn., Rochester — WAREHOUSE — Rochester Dairy Cooperative, Rochester, general contract brick warehouse, to G. Schwartz & Co., Rochester. Est. $40,000.

N. J., Wayne—PLANT—Mac Moulding Co., Route 23, 1 story, brick, 120x150 ft. fuse plant, to Edmund R. Stearns, Inc., 164 Glenridge Ave., Montclair, $210,000. J. Dunn, c/o owner, archt.

O., Girard — FACTORY — General Plant Corp., Hill, Hubbel & Co. Div., M. M. Bowen, div. mgr., 3091 Mayfield Rd., Cleveland, design and construction 1 story, 170x360 ft., steel frame, concrete block factory, to Austin Co., 16110 Euclid Ave., Cleveland. Est. $276,000. CD 11/27—ENR 11/30.

Pa., Beaver Falls — PLANT — Babcock & Wilcox Tube Co., P. D. White, vice pres. and genl. mgr., 1 story, 126 x 200 ft., sheet steel siding plant addn., separate contracts. $85,000.

Pa., Bristol—PLANT—Rohm & Haas Co., Bristol Pike, mfg. bldg. addns., to Henry E. Baton, Inc., 1717 Sansom St., Phila., $46,950. Awarded 1/24.

Pa., Phila.—PLANT—J. G. Brill Co., J. F. Larkin, exec. in charge, 62 and Woodland Ave., mfg. plant exten. to C. H. Schwertner, 1220 Hamilton St., $40,000. Awarded 1/8.

Pa., Phila.—PLANT—Container Corp. of America, J. W. McAllister, ch. engr., Fountain and Nixon Sts., altering Bldgs. D and C, to David M. Hunt, 1700 Sansom St., Phila., $55,000. Awarded 1/2.

Pa., Phila. — FACTORY — Proctor & Schwartz, Inc., 3 and Hunting Park Ave., factory exten., to Steele Pownall & Gebhardt, 1316 Arch St., $70,000. Awarded 1/24.

Pa., Phila.—ENGINE SHOP—Reading Co., E. Y. Allen, ch. engr., Reading Terminal, Phila., Zone 1, diesel engine shop addns. alterations, to J. R. Farrell, 4422 Market St., $40,000. Awarded 1/24.

Pa., Pittsburgh—BOILER HOUSE—F. J. Kress Box Co., F. J. Benjamin, vice pres. in charge, 1-28 St., altering, equipping, boiler house, foundation work, new boiler, conveying equip. separate contracts. $50,000. CD 1/10—ENR 1/18.

Tex., Austin—WAREHOUSE—Southwestern Ice & Cold Storage Co., 301 Colorado St., 92 x 128 ft. warehouse, to J. M. Odom, P. O. Box 774, $40,000. CD 1/24—ENR 2/1.

Tex., Brownsville—FREEZING PLANT—Pan-American Freezers, c/o F. H. Floyd, Eagle Pass, (1st unit) fruit and vegetable quick freezing plant, to E. A. Noser Constr. Co., State Bank Bldg., McAllen, $80,000. Total est. $250,000. CD 1/9—ENR 1/11.

Tex., Edcouch — PACKING PLANT — Bob Tankersley Produce Co., 610 W. Kruttschnitt St., Edinburg, 2 story vegetable and citrus packing plant, brick, rein.-con., sheet metal day labor, approx. $40,000. CD 1/19—ENR 1/25.

Tex., Houston—SHOP—Daniel Office Furniture Co., 5405 Clinton St., 1 story, 50 x 80 ft., steel frame, corrugated iron shop, concrete fdn., to W. A. Brunet, Shell Bldg., $40,000. CD 1/25—ENR 2/1.

Tex., Houston—PLANT—Southern Warehouse Corp., 4410 Clinton Dr., rice drying plant, to W. S. Bellows Constr. Co., 716 N. Everton St., approx. $190,000. Lockwood & Andrews, Union National Bank Bldg., engr. CD 1/17—ENR 1/25.

Tex., Weslaco — PACKING PLANT — Val Verde Packing Co., Weslaco, 2 story metal citrus and vegetable packing plant, rein.-con., brick, day labor, approx. $42,000. CD 1/17—ENR 1/25.

Va., Roanoke—FEED MILL, etc.—Roanoke City Mills Inc., Roanoke, design and construction feed mill and warehouse, to Jones-Hettelsater Constr. Co., 1012 Baltimore St., Kansas City, Mo.

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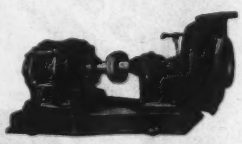

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INDUSTRIAL BLDGS. (Contracts Awarded, Cont'd.)

Wis., Fond du Lac—GARAGE—Service Motors, Inc., 23 E. 1 St., 1 story, 71 x 130 ft., structural steel, concrete block garage, concrete fdn., to Immel Co., 101 S. Main St. CD 12/6—ENR 12/14.

Wis., Shawano—GARAGE—Badger Co-operative, Shawano, 1 story, 76 x 118 ft., brick, rein.-con. garage, to Fred Lemke Constr. Co., Shawano. J. F. Dreger, 188 Waugoo St., Oshkosh, archt.

Ont., Oakville—PLANT—Barringham Rubber Co., Ltd., Reynolds St. W., plant addn., Reynolds St. N., to W. H. Cooper Constr. Co. Ltd., Medical Arts Bldg., Hamilton, Ont. about $75,000-$100,000.

Ont., Pembroke—PLANT—Pleasant View Dairy, Ltd., A. A. Campbell, mgr., Pembroke, 1 story, 80x40 ft., cinder block, plant, concrete fdn., to L. Marqus, Pembroke, about $40,000. CD 1/25—ENR 2/1.

Ont., Port Dalhousie—PLANT—Nu-Bone Corset Co. of Canada, Ltd., 48 Main St., reconstructing plant, to Rigby Ltd., 3 Hellwell St., St. Catherines. Est. $40,000.

Ont., Toronto—WAREHOUSE—Ogilvie Flour Mills Co. Ltd., Sun Life Bldg., Montreal, Que., warehouse and office, Fleet St., to Milne & Nicholls, Ltd., 57 Bloor St. W., approx. $135,000. C. R. Tetley, 65 St. Sulpice Rd., Westmount, archt. CD 8/15—ENR 8/17.

Ont., Toronto—FACTORY—Watson Spring Co., Ltd., 191 Parliament St., 1 story, 50x200 ft., concrete block factory, King St. E. to James Bodie Constn. Co., Ltd., 456 Pape Ave., about $75,000.

Que., Montreal—FACTORY—Belding-Corticelli, Ltd., 1455 Shearer St., factory, Waverley St., to Deakin & Stewart, 1440 W. Ste. Catherine St. Est. $40,000.

UNCLASSIFIED

PROPOSED WORK

Alabama — SERVICE EXTENSIONS — South Alabama Elec. Coop., Troy., service extens., Pike Co. $45,000.

★**Calif., Los Angeles**—AIRPORT PAVING, etc.—City, Bd. P. Wks., City Hall, 1,200,000 sq. ft. paving, administration bldg., municipal airport imprvs. $1,000,000 W DeSilva, City Hall, dir. Airports.

Fla., Clearwater—PARK GRADING, etc.—City, Mayor Seavey, engr., City Hall, grading, landscaping bldgs. and walks in memorial park on 4 acre track recently purchased in downtown section. $105,000.

Illinois — RAILROAD WORK — Peoria & Eastern Ry., c/o Cleveland, Cincinnati, Chicago & St. Louis Ry., F. J. Jerome, ch. engr., LaSalle St. Station, Chicago, Zone 5, Wabash R.R. Co., J. C. Bousfield, ch. engr., Ry. Exchange Bldg., St. Louis 1, Mo., and Illinois Central R.R. Co., C. H. Mottier, ch. engr. system, 135 E. 11 Pl., Chicago, Zone 5, changes in protection crossings on 3 above railroad lines, within city limits of Champaign, except for ¼ street in Urbana. Over $25,000.

Ia., Iowa Falls—AIRPORT—City, F. F. Dougan, clk., City Hall, approved $25,000 bond issue, municipal airport.

Kansas — SERVICE EXTENSIONS — Ark Valley Elec. Coop. Assn., Inc., Hutchinson, service extens., Reno Co. $50,000.

La., Golden Meadow—WHARVES, etc.—A. Angelette, Golden Meadow, 2 timber wharves and new bldg., all on timber pile fdn., and installing mooring piles in Bayou Lafourche.

Mo., Springfield—AIRPORT—City, H. B. Carr, mayor, City Hall, $150,000 bond election Mar. 6, completing Springfield-Green County Airport. CD 1/10—ENR 1/18.

Neb., Sidney—AIRPORT—City, R. E. Roch, mayor, surveys municipal airport. $100,000. CAA.

N. J., Camden—LOADING PLATFORM—Railway Express Agency, Inc., Market St., repairing loading platform. $75,000.

Okla., Marble City—SPUR TRACK—Kansas City Southern Ry. Co., E. F. Salisbury, ch. engr., Kansas City Southern Bldg., Kansas City, Mo., preparing plans spur track to Dunlap stone quarry and constructing bridge over Salisaw Creek at quarry. $50,000.

Pa., Ardmore — PARK — Lower Merion Twp. Comn., Ardmore, plans by M. Stevenson, 225 S. 15 St., Phila., botanical park, memorial to servicemen and women, Lower Merion Twp., near here. $25,000.

†**Pa., Phila.** — AIRPORT FACILITIES — Civil Aeronautics Admin., 385 Madison Ave., New York 17, N. Y. and Dpt. P. Wks., Phila., airport facilities at Northeast Airport. $200,000. CD 8/3—ENR 8/10.

†**Pa., Phila.** — SPRINKLER SYSTEM — U. S. Eng., Standard Oil Bldg., Baltimore, Md., plans under way, sprinkler sys. for Frankford Arsenal. $145,000. CD 11/29—ENR 12/7.

R. I., Newport—WHARF—City, A. Easton, comr., rebuilding pile, timber Long Wharf. Over $25,000.

Texas — TRANSMISSION LINE — Central Power & Light Co., Corpus Christi, 88 mi. 66,000 volt power transmission lines, Kleberk, Willacy, Cameron and Kennedy Counties. $50,000.

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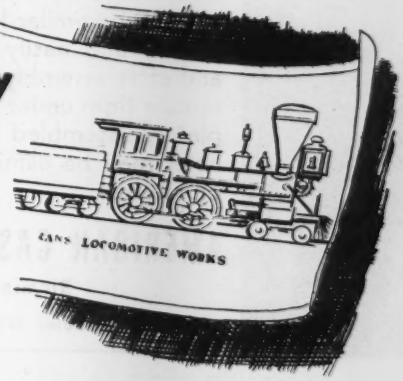

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UNCLASSIFIED (Proposed Work, Cont'd.)

Texas — RURAL ELECTRIFICATION LINES — Lyntegar & Electric Cooperative, Tahoka, rural electric line extens., Lynn Co. $75,000 REA allot.

Texas—RURAL ELECTRIC LINES—Rusk County Electric Cooperative, Henderson, rural electric line extens., Rusk Co. $40,000 REA allot.

Texas—SERVICE EXTENSIONS, etc.—Wharton County Electric Cooperative, Wharton, service extens., remodeling office bldg., Wharton Co. $75,000 REA allot.

†Tex., Biggs Field (br. El Paso)—HANGAR—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., type Hang-A-R hangar. Over $40,000.

Tex., Gainesville—STADIUM—Gainesville Community Circus, Gainesville, 1,000 capacity stadium (County Fair), 2 stages, exhibition ring, etc. $75,000.

Que., Buckingham — MICA DEVELOPMENT—G. P. Spittal, 275 McLeod St., Ottawa, Ont., developing mica and soluble phosphate deposits in area 9 mi. north of here. $50,000.

Que., Malartic—LIGHTING SYSTEM—Municipality, street lighting sys. $30,000. L. Thaurette, Town Hall, engr.

Que., Quebec City—CAMP — Anti-Tuberculosis League, c/o Hon. Ferdinand Roy, 16 du Parloir Ave., summer camp for tubercular children. $40,000.

BIDS ASKED

Bids Asked After February 2

†Tex., Randolph Field—HANGARS—U. S. Eng., Fort San Houston, 202x221 ft., steel Hanger 1, rein.-con. fdn., $150,000; Hanger 2, $125,000; Hangar 3, curtain walls, etc., $125,000, all foregoing Serial No. W-41-156-45-71. CD 1/31.

Bids Asked February 15

†Tex., Denton—AIRPORT—Civil Aeronautics Admin., P. O. Box 1689, Fort Worth, airport imprvs., incl. seeding 133 acres, 400,000 cu. yd. excv., 4,200 ft. drainage sys. and 1,200 lin. rods Class "C" fencing. Plans deposit $20. CD 1/23—ENR 1/25.

Bids Asked February 23

Tex., San Antonio—SWIMMING POOLS—M. L. Diver, engr., City Hall, rein.-con. outdoor swimming pool, Old Eagle Field, $100,000; rein.-con. outdoor Olympic type swimming pool, Brackenridge Park, $125,000. CD 1/24—ENR 2/1.

Bids Asked

N. J., Bergenfield—ROLLER SKATING RINK—Bergenfield Amusement Corp., c/o H. Lucht, archt., 1700 Teaneck Rd., West Englewood, 1 story, 125x175 ft. frame, concrete roller skating rink, S. Washington Ave. $40,000. CD 1/3—ENR 1/11.

Texas — GATHERING LINES — Chicago Corp., c/o Tennessee Gas & Transmission Co., Commerce Bldg., Houston, addnl. natural gas gathering lines, Panola Co. $100,000.

LOW BIDDERS

†La., Camp Livingston—TRAINING AIDS—U. S. Eng., 300 Bway., Little Rock, Ark., Jan. 30, addnl. training aids, from Mid-State Const. Co., Alexandria, **$63,183.**

†La., Kenner—RUNWAYS—U. S. Eng., Avenue F and 25 St., Galveston, Tex., about Jan. 25, exten. East-West Runway at Moisant Airport, Solic. 41-243-45-C44, from T. L. James & Co., Ruston, **$283,886** on Bids 1 and 2. CD 1/16—ENR 1/18.

†S. D., Provo—FIRE WALLS—U. S. Eng., 909 17 St., Denver, Colo., fire walls at Black Hills Ordnance Depot, from Spiegelberg Lbr. & Bldg. Co., 259 W. Fremont St., Laramie, Wyo., **$56,000.**

Tex., Houston—HANGAR—CITY, M. H. Westerman, secy., Jan. 24, 1 story, 100x150 ft., steel frame hangar between Hangars 1 and 2 on west side of municipal airport, from R. P. Farnsworth & Co., Bankers Mortgage Bldg., **$49,123.** CD 9/20—ENR 9/28.

†Wash., Seattle—PIERS—U. S. Eng., 860 3 Ave., Zone 4, Jan. 30, repairing, replacing timber guide piers, Lake Washington Ship Canal, Neg. 1079, from Manson Constr. & Engrg. Co., 821 Alaskan Way, Zone 4, **$136,300.** CD 1/23.

CONTRACTS AWARDED

★ **†Ariz., Tucson** — AIRPORT IMPROVEMENTS—U. S. Eng., 751 S. Figueroa St., Los Angeles 14, Calif., taxiways, warm-up and parking aprons, etc., at Davis-Monthan Field, to Basich Bros. Const. Co., 600 S. Fremont Ave., Alhambra, Calif., **$942,815.** Bids 1/22. CD 1/25—ENR 2/1, under LB.

Calif., Richmond—PIERS, etc.—H. J. Kaiser Co., Richmond, 2 finger piers, to Morrison-Knudsen Co., 810 Title Guarantee Bldg., Los Angeles, **$414,860;** installing electrical distr. and communication sys. at Repair Facilities Basin, Yard 3, to Emerson-Newberry Co., Inc., 55 New Montgomery St., San Francisco; yard piping, repair facilities basin, Yard 3, to Macco Constr. Co., Freight and Ferry Sts., Oakland.

†Fla., Pensacola — RANGE IMPROVEMENTS—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D.C., range imprvs., Gulf Beach, NOY 2703, to Royce Kershaw & Co., P. O. Box 25, Montgomery, Ala. **$58,738.**

UNCLASSIFIED (Contracts Awarded, Cont'd.)

Ind., Fort Wayne—AIRFIELD BLDGS.—Bd. Aviation Comrs., Fort Wayne, temporary civilian air terminal facilities, cement block bldg. with plumbing, heating, wiring, ship bldg. with plumbing, heating, wiring, ship access, grading, roads, fencing, sidewalks, etc., at Baer Field on west side of field along Keller Rd., to Buesching Brothers Constr. Co., 2191¼ E. Berry St., Fort Wayne, $59,744. Bids 1/23. CD 1/17.

†La., Algiers — WHARF — Todd-Johnson Dry Docks, Inc., 724 Common St., New Orleans, rein.-con. deck wharf, incl. steel piles, gangway, tracks, dredging, to W. Horace Williams Co., Southern Blvd., New Orleans, $335,000; electrical work, to C. W. Nussbaum, 629 Julia St., New Orleans, $83,931. CD 1/29—ENR 2/1, under LB.

†La., Barksdale Field (br. Shreveport)—HANGAR—U. S. Eng., 300 Bway., Little Rock, Ark., hangar, Inv. 03-050-45-42, to Koramo Constr. Co., Porter Bldg., Memphis, Tenn., $128,861. Bids 1/23.

Mich., Detroit—WHARF—Detroit & Cleveland Navigation Co., foot of Third St., timber, concrete wharf at Detroit River and Third St., to A. J. Dupuis, 1312 Ford Bldg., Detroit, $25,000.

N. J., Mays Landing—CLEARING SITE—Atlantic City Racing Assoc., J. B. Kelly, pres., 770 S. Schuylkill Ave., Phila., Pa., clearing site for race track, to A. P. Miller Co., Inc., 3333 Arctic Ave., Atlantic City, $35,000. Awarded 1/15. J. Sloan, 420 Lexington Ave., New York, N. Y., archt.

†N. J., Somerville—SPRINKLER SYSTEM—U. S. Eng., 120 Wall St., New York 5, N. Y., sprinkler sys., to Rockwood Sprinkler Co., 31 Clinton St., Newark, $273,053. Bids 12/7.

†N. M., Kirtland Field (br. Albuquerque)—HANGARS—U. S. Eng., P. O. Box 1538, Albuquerque, hangar, to K. L. House Constr. Co., 214 E. Marquette St., Albuquerque, $118,000; 2 hangars, to R. E. McKee, 1918 Texas St., El Paso, Tex., $210,000. CD 1/24—ENR 2/1.

Oklahoma—GAS GATHERING PIPELINE—Phillips Petroleum Co., Bartlesville, laying approx. 70 mi. 2- to 20-in. steel pipeline (gas) carrier, to H. Liles, 3600 W. Reno St., Oklahoma City, $196,000. Est. $140,000. CD 1/25—ENR 2/1.

†Tenn., Memphis — SWIMMING POOL — U. S. Eng., Grant St., west of Westwood St., Mobile, Ala., swimming pool, outside utilities at Kennedy General Hospital, Getwell Ave., to V & M Constr. Co., 166 Monroe Ave., $126,590.

Texas—TRANSMISSION LINES — Southwest Texas Electric Cooperative, Inc., Eldorado, 202 mi. rural electric power transmission lines. Schleicher Co. to Taylor Constr. Co., Taylor, $136,846. CD 1/4—ENR 1/11.

Tex., Borger—PIPELINE CARRIER—Phillips Petroleum Co., Bartlesville, Okla., laying 22 mi. 24 in. steel pipeline carrier, Sneed Area, to R. H. Fulton & Co., 2201 Esperson Bldg., Houston, $128,000; 8 mi. 24 in. steel pipeline carrier (gas), to United Contracting Co., Wichita Falls, $86,000, both for Carbon Black Plant. CD 1/29—ENR 2/1.

Tex., Charlotte—PIPELINE CARRIER—Humble Oil & Refining Co., Humble Bldg., Houston, laying approx. 20 mi. 6 in. steel pipeline crude oil carrier, force account. $40,000. CD 1/29—ENR 2/1.

Tex., Houston—LOADING DOCK—Capitol Wholesale Drug & Liquor Co., 2300 McKinney Ave., rein.-con. loading dock, to Glenn T. Haigler, 124 Evans St., approx. $25,000. CD 1/24—ENR 2/1.

Tex., San Antonio—RADIO STATION—K.A.B.C., Milam Bldg., 2 story, brick, concrete, 50,000 watt radio station, 9 mi. northwest of here, to C. L. Browning, Jr., 812 Insurance Bldg., approx. $45,000. Bartlett Cocke, 1504 Milam Bldg., archt. CD 11/1—ENR 11/16, under Postwar Projects.

†Va., Norfolk — TELEPHONE SYSTEM, etc.—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., telephone and fire alarm systems, etc., Naval Operating Base, NOY 11304, to Industrial Power Equipment Co., 5 E. Center St., Baltimore, Md. $33,400.

†Wash., Seattle—SPRINKLER SYSTEM—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., sprinkler sys., Naval Station, NOY 11244, to Viking Automatic Sprinkler Co., 1120 8 Ave. S. $101,370.

†Canal Zone—DRYDOCK—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., addnl. drydock work, transmitted Panama Canal, NOY 11759, to Pacific Bridge Co., 333 Kearny St., San Francisco, Calif., est. $250,000. CD 2/1.

Que., Rouville (P. O., St. Hilaire)—POWER LINES—Electric Co-Op. Soc., c/o G. Daigneault, secy., Rouville, 30 mi. power lines, to Bedard-Girard Ltd., 177 W. Lagauchetiere St., Montreal. $31,000.

Proposal Advertisements see p. 284

Postwar Projects see p. 184

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Bids: Feb. 28 **(343)**

Bridge Structure

MISSISSIPPI RIVER HIGHWAY BRIDGE AT MEMPHIS, TENNESSEE—CRITTENDEN COUNTY, ARKANSAS MAIN BRIDGE SUBSTRUCTURE PROJECT NO. SN-A-SN-U-FAP 607-A(2), PART 1.

TENNESSEE—ARKANSAS

Sealed duplicate proposals will be received by the Department of Highways and Public Works of Tennessee and the Arkansas State Highway Commission, jointly, at Room 107, Courthouse at Memphis, Tennessee, until 10:00 a. m. Central War Time on February 28, 1945, for the construction of Tennessee-Arkansas Project No. SN-A-SN-U-FAP 607-A(2), Part 1 consisting of the Memphis abutment and the seven main piers of a highway bridge over the Mississippi River, between Memphis, Tennessee, and Crittenden County, Arkansas, and will be publicly opened and read immediately thereafter in the City Council Chamber in the Courthouse, Memphis, Tennessee.

The work to be performed under this contract will consist principally of the construction on the Memphis bank of a stone-faced abutment anchorage and connecting retaining walls, the construction of four pneumatic caisson founded stone-faced main river piers in the navigable section of the river, and the construction of three caisson founded stone-faced piers on the Arkansas bank, all of which support the main superstructure over the Mississippi River, as shown on the contract plans.

Bidders will be required to file with their bids duplicate financial, equipment and experience questionnaire forms made out in detail, which forms will be furnished with bid blanks.

A bidder's bond in duplicate in the amount of $250,000, payable jointly to the Department of Highways and Public Works of Tennessee and the Arkansas State Highway Commission on the forms furnished with the proposal, will be accepted by the States only from a surety or sureties qualified to do business both in Tennessee and Arkansas and holding certificates of authority from the United States Treasury Department and conforming to the limitations of the last published Treasury statement on acceptable sureties.

Plans, specifications and contract documents, together with forms, questionnaires and necessary information, are open to public inspection at the offices of the Department of Highways and Public Works of Tennessee, Nashville, Tennessee, and the Arkansas State Highway Commission, Little Rock, Arkansas, and of Modjeski and Masters, Engineers, State Street Building, Harrisburg, Pennsylvania, and at Room 107, Courthouse, Memphis, Tennessee, and may be secured from Modjeski and Masters, Engineers, State Street Building, Harrisburg, Pennsylvania, upon a deposit of $20.00 per set.

A refund of $10.00 per set will be made by Modjeski and Masters upon the return in good condition to them of the copy so obtained.

The opening of bids is contingent on authorization by the War Production Board of beginning of construction, together with the granting of the preference ratings and allotments of critical materials for the work. If such authorization is not issued by the time specified for the opening of bids, all proposals will be returned unopened to the respective bidders.

No bid may be withdrawn after having been deposited or filed.

The right is reserved to reject any or all bids and to waive all technicalities.

DEPARTMENT OF HIGHWAYS AND PUBLIC WORKS OF TENNESSEE
C. W. PHILLIPS, Commissioner.
ARKANSAS STATE HIGHWAY COMMISSION
J. H. CRAIN, Chairman.

U. S. GOVERNMENT

Public Roads Administration: Federal Works Agency, Arlington County, Virginia, January 29, 1945, SEALED BIDS will be received at the office of the Division Engineer, Public Roads Administration, 1440 Columbia Pike, Arlington, Virginia, until 10:00 o'clock a.m., E.W.T., February 20, 1945, for the construction of Project 5B8 National Capital Parks, Washington, D. C. Type of Improvement: Installation of two steel struts (furnished by the U. S. Government) between the piers of the existing bridge over Boundary Channel at the south end of Columbia Island, located on the Mt. Vernon Memorial Highway. Minimum rates of wages for laborers and mechanics on this project have been fixed by the Secretary of Labor as required by law. When plans and specifications are requested, a deposit of $10.00, certified check or cash, will be required to insure their return within fifteen days after opening of bids. Checks must be made payable to the Treasurer of the United States. Plans, specifications and proposal forms may be obtained at the address given above. H. J. Spelman, Division Engineer. (353)

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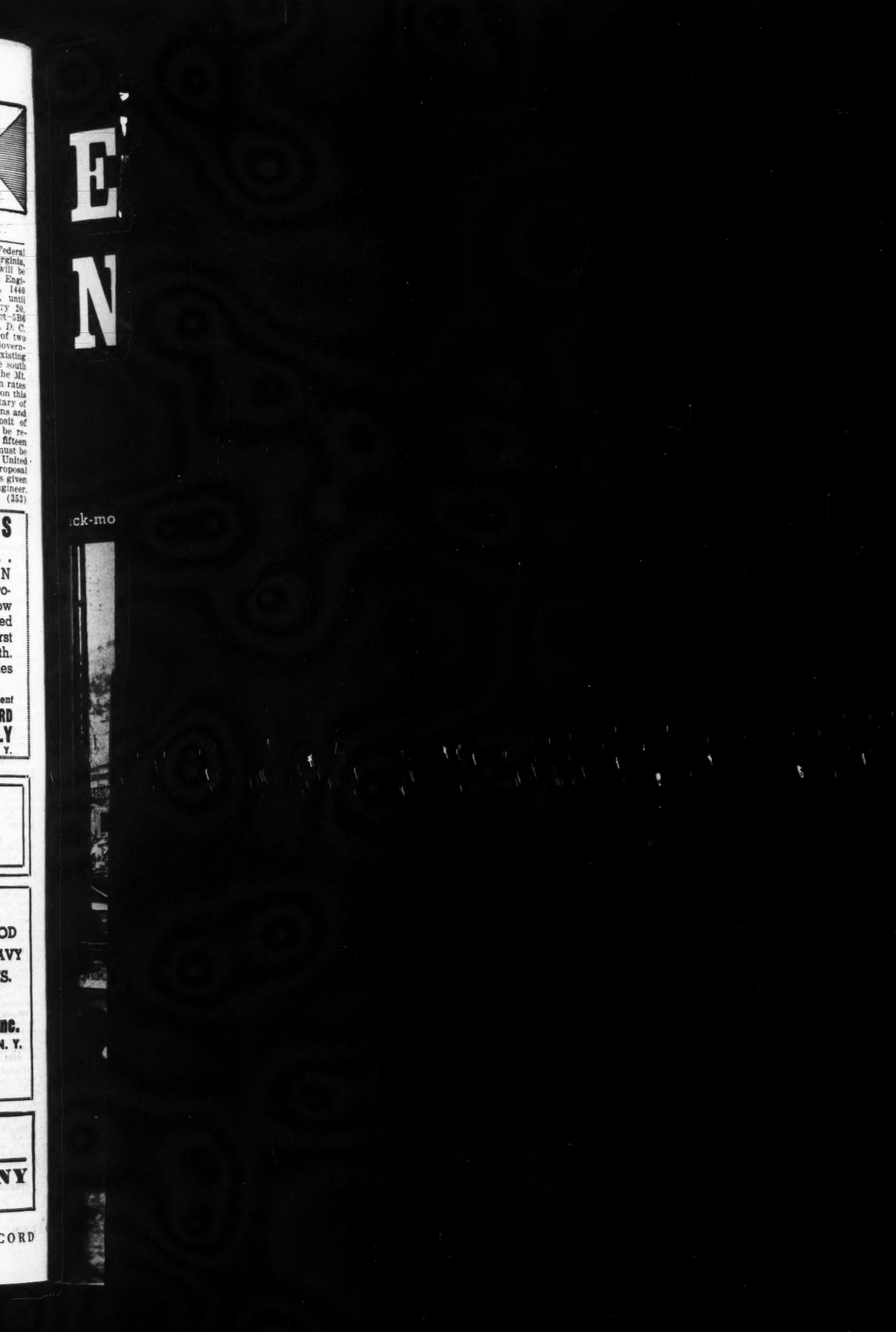
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